7.0 GROUNDWATER INVESTIGATION

7.1 PURPOSE AND SCOPE

Groundwater sampling was conducted at the site in both new and existing shallow, intermediate, and deep monitor wells to fully assess the types and concentrations of contaminants present in the underlying aquifer, and to determine the extent and magnitude of groundwater contamination in this aquifer at the site. Groundwater sampling was also conducted to evaluate the presence of DNAPLs at this site.

As discussed in Section 2.0, a total of 24 new monitor wells (12 soil overburden and 12 upper bedrock) were installed at the approximate locations shown in Figure 2-1 to supplement the 8 existing monitor wells installed by the state and 9 existing monitor wells installed by the Mead Corporation on the site (also shown in Figure 2-1) prior to this remedial investigation. The locations and depths of the newly installed monitor wells were selected to monitor the soil overburden zone and the upper bedrock zone of the aquifer system (described in Section 2.4) upgradient and downgradient of the four source areas investigated in this RI. The siting rationale are provided in **Table 7-1**.

Groundwater sampling for contaminant type and quantity included sampling of the 24 newly installed monitor wells, as well as the 8 existing monitor wells installed by the state at the coke plant, the 9 existing monitor wells installed by Mead Corporation at the coke plant, and the 10 existing monitor wells installed by Velsicol on their property near the coke plant boundary shown in **Figure 7-1**.

7.2 METHODS

After all the new monitor wells were installed and developed, one groundwater sample was collected from each of the 24 new monitor wells and the 27 existing monitor wells identified

TABLE 7-1

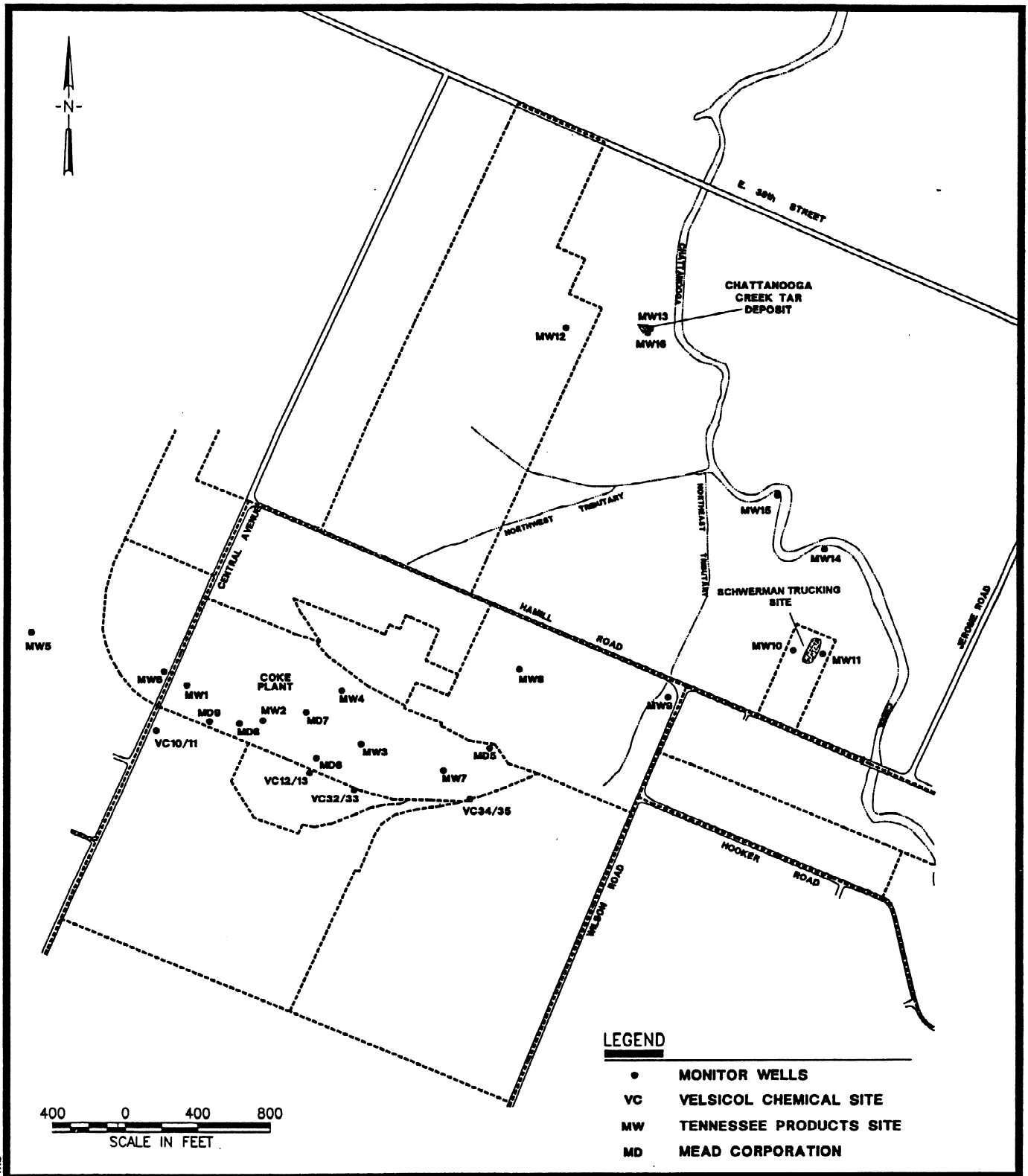
NEW MONITOR WELL SITING RATIONALE
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Number	Well Screen Depth (feet)	Siting Purpose
MW-01-IN	53	To monitor groundwater in the upper bedrock zone at the existing MW1 well cluster on the coke plant.
MW-02-IN	34	To monitor groundwater in the upper bedrock zone at the existing MW2 well cluster on the coke plant.
MW-03-IN	40	To monitor groundwater in the upper bedrock zone at the existing MW3 well cluster on the coke plant.
MW-04-IN	46	To monitor groundwater in the upper bedrock zone at the existing MW4 well cluster on the coke plant.
MW-05-SH MW-05-IN	37 51	To provide background groundwater concentration data for the site in both the overburden and upper bedrock zones.
MW-06-SH MW-06-IN	14 54	To monitor groundwater in both the overburden and upper bedrock zones upgradient of the coke plant toward the west.
MW-07-SH MW-07-IN	13 29	To monitor groundwater in both the overburden and upper bedrock zones on the eastern portion of the coke plant.
MW-08-SH MW-08-IN	12 28	To monitor groundwater in both the overburden and upper bedrock zones downgradient of the coke plant toward the north.
MW-09-SH MW-09-IN	17 31	To monitor groundwater in both the overburden and upper bedrock zones downgradient of the coke plant toward the northeast.

TABLE 7-1 (cont.)

NEW MONITOR WELL SITING RATIONALE
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Number	Well Screen Depth (feet)	Siting Purpose
MW-10-SH MW-10-IN	17 35	To monitor groundwater in both the overburden and upper bedrock zones upgradient of the Hamill Road Dump #2.
MW-11-SH MW-11-IN	12 34	To monitor groundwater in both the overburden and upper bedrock zones downgradient of the Hamill Road Dump #2.
MW-12-SH MW-12-IN	13 37	To monitor groundwater in both the overburden and upper bedrock zones upgradient of the Chattanooga Creek Tar Deposit.
MW-13-SH	11	To monitor groundwater in the overburden zone downgradient of the Chattanooga Creek Tar Deposit.
MW-14-SH	13	To monitor groundwater in the overburden zone downgradient of the Chattanooga Creek Sediments (during periods of high flow).
MW-15-SH	14	To monitor groundwater in the overburden zone downgradient of the Chattanooga Creek Sediments (during periods of high flow).
MW-16-SH	10	To monitor groundwater in the overburden zone downgradient of the Chattanooga Creek Tar Deposit. Note: It was initially intended for this monitor well to be screened in the upper bedrock (to form a well cluster with MW-13-SH), but due to access problems, an air rotary drilling rig could not be mobilized to this location. A second shallow monitor well was



GROUNDWATER SAMPLE LOCATIONS

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

Tennessee Products Site
Chattanooga, Tennessee

FIGURE No. 7-1

GW_SAMP/14JUN96/800

above. These samples were sent to a CLP laboratory or the EPA ESD laboratory for complete TCL/TAL analyses. Just prior to sampling of each monitor well, field measurements of the groundwater temperature, pH, conductivity, and turbidity were taken, and the results are provided in Appendix D. All groundwater samples collected were grab samples and were collected according to the *Final Work Plan* (CDM Federal, 1995) for the Tennessee Products Site RI/FS and EPA's *Standard Operating Procedures and Quality Assurance Manual* (EPA, 1991).

7.3 SUMMARY

The concentrations of chemicals detected in the groundwater samples collected are summarized in **Tables 7-2** through **7-13**, which are organized by source area. In these tables, those concentrations considered to reflect a valid detection of unnatural contamination (i.e., measured above the 95% confidence upper limit background concentration) are printed in bold italicized text to distinguish them from the other measurements. Note that Tables 7-2 through 7-4 summarize the groundwater analytical data reported by Mead Corporation for their 1995 "Post-Removal Baseline Assessment" of the coke plant. These data are included in this remedial investigation analysis since they are recent, and appear to be valid and appropriate for a remedial investigation. Note also that for the purpose of summarizing, only chemicals detected at least once in groundwater (at each source area) and their measured concentrations are presented in the summary tables. Complete analytical results for the CLP and EPA ESD laboratory analyses performed are provided in Appendix E. Complete analytical results for the 1995 Mead Corporation analyses are provided in the *Post-Removal Baseline Assessment Report* (Mead, 1995).

TABLE 7-2

1995 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-SH	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-DP	Coke Plant MW-04-SH	Coke Plant MW-04-DP
SILVER	1.7	0.6 U	0.6 U	0.6 U	***2.8***	0.6 U	0.6 U	0.6 U
ARSENIC	***8.1***	3.5 U	3.5 U	***9.9***	3.5 U	3.5 U	3.5 U	3.5 U
BARIUM	104	184	180	***5320***	34.4	115	29.7	52.8
BERYLLIUM	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
CADMIUM	0.5 U	0.5 U	0.5 U	0.93	0.5 U	0.5 U	0.5 U	0.5 U
COBALT	***67.3***	2.4	3	1.9	43.4	1.8	40.3	0.85
CHROMIUM	3.2	2.2 U	16.4	2.2 U	2.2 U	2.2 U	2.2 U	6.8
COPPER	0.8 U	3.1	6.3	0.8 U	0.8 U	0.8 U	0.81	4
NICKEL	6.4	***214***	1.9	34.2	20.8	10.7	11.9	12.3
LEAD	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	2.1	1.6 U	1.6 U
ANTIMONY	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
SELENIUM	***15***	4.4 U	4.4 U	4.4 U	***5.4***	4.4 U	4.4 U	4.4 U
VANADIUM	0.92	0.51	0.72	0.85	0.68	0.5 U	1.2	0.5 U
ZINC	9.2	6.4	5.5	13.8	3.3	4.4	***102***	10.3
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	***0.23***	0.2 U
ALUMINUM	19.2 U	75.6	105	19.2 U	19.2 U	97.6	106	191
MANGANESE	***60500***	1240	1850	6280	***28600***	22.6	3550	67.1
CALCIUM	45400	190000	146000	***1260000***	140000	115000	102000	90600
IRON	27000	288	145	***58800***	3860	129	163	96.3
MAGNESIUM	8030	40800	18000	***333000***	12300	61800	9460	36000
SODIUM	18500	14600	15500	***233000***	***105000***	40400	23600	43000
POTASSIUM	725 J	2290 J	5060 J	***21100 J***	6880 J	11600 J	2410 J	12700
CYANIDE	10 U	10 U	***111***	10 U	***91.8***	***35.2***	10 U	10 U

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-2 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12	Coke Plant MD-07-51	Coke Plant MD-08-63
SILVER	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
ARSENIC	3.5 U	3.5 U	5.5	4	4.5	4.6	4.6	3.5 U
BARIUM	54.4	67	150	95.1	***3330***	53.3	115	297
BERYLLIUM	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
CADMIUM	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.96	0.5 U	0.5 U
COBALT	3	1.7	1.3	2.2	3.8	64.9	2.6	0.98
CHROMIUM	24.7	2.2 U	4.3	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
COPPER	3.4	0.88	0.96	5.7	0.8 U	0.81 U	12	0.8 U
NICKEL	53.8	3	10.9	4.7	25.1	37.4	22.8	10.4
LEAD	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
ANTIMONY	1.9 U	2 U	1.9 U	1.9 U	2.6	1.9 U	1.9 U	1.9 U
SELENIUM	4.4 U	4.4 U	4.4 U	4.4 U	***6***	***12.1***	4.4 U	4.4 U
VANADIUM	2.6	0.94	2.2	0.88	0.81	3.4	0.7	1.7
ZINC	3.8	4.4	2	5.4	8.6	27.5	10.3	1.9
MERCURY	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	***0.25***	0.2 U	0.2 U
ALUMINUM	94.2	99.4	94.7	19.2 U	19.2 U	19.2 U	19.2 U	102
MANGANESE	2190	59.7	60.8	9700	***27700***	***27600***	8330	1510
CALCIUM	160000	196000	157000	47700	***2120000***	***505000***	***828000***	263000
IRON	35.6	27.2 U	618	17100	24500	***148000***	12700	27.2 U
MAGNESIUM	26400	19100	31200	7270	***302000***	***115000***	***152000***	80100
SODIUM	39300	59300	***112000***	***239000***	***245000***	***105000***	***237000***	31700
POTASSIUM	950 J	2080 J	***18100 J***	5770 J	***23800 J***	***22200 J***	9800 J	4360 J
CYANIDE	10 U	10 U	10 U	***10.5***	***14.2***	***439***	***114***	10 U

Data Qualifiers:

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J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-2 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant
Well ID:	MD-09-20
CHEMICAL	
SILVER	0.6 U
ARSENIC	3.5 U
BARIUM	***795***
BERYLLIUM	***6.1***
CADMIUM	1.8
COBALT	***610***
CHROMIUM	5.5
COPPER	***38.9***
NICKEL	***146***
LEAD	10.8
ANTIMONY	1.9 U
SELENIUM	***10.8***
VANADIUM	0.5 U
ZINC	***472***
MERCURY	0.2 U
ALUMINUM	***25200***
MANGANESE	***45400***
CALCIUM	106000
IRON	***108000***
MAGNESIUM	21100
SODIUM	***173000***
POTASSIUM	6730 J
CYANIDE	10 U

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-3

1995 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-SH	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-DP	Coke Plant MW-04-SH	Coke Plant MW-04-DP
VOLATILE ORGANICS								
CHLOROMETHANE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	670 UJ
1,1-DICHLOROETHANE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	670 U
CHLOROFORM	10 U	10 U	10 U	50 U	10 U	10 U	10 U	670 U
1,2-DICHLOROETHANE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	***420 J***
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	***790***
CARBON TETRACHLORIDE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	670 U
TRICHLOROETHENE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	***210 J***
BENZENE	***3 J***	10 U	***5 J***	***280***	10 U	10 U	10 U	670 U
TETRACHLOROETHENE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	***7000***
TOLUENE	10 U	10 U	10 U	***12 J***	10 U	10 U	10 U	***170 J***
CHLOROBENZENE	***110***	***1 J***	10 U	***930***	***68***	10 U	10 U	670 U
ETHYL BENZENE	10 U	10 U	10 U	***7 J***	10 U	10 U	10 U	670 U
TOTAL XYLENES	10 U	10 U	10 U	92B	10 U	10 U	10 U	670 U
ACETONE	10 U	10 U	10 UJ	50 UJ	10 U	10 U	10 U	670 U
CARBON DISULFIDE	10 U	10 U	10 U	50 U	10 U	10 U	10 U	670 U
1,2-DICHLOROETHENE (TOTAL)	***2 J***	10 U	10 U	50 U	10 U	10 U	10 U	670 U
PESTICIDES								
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

NA = The chemical was not analyzed for.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-3 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12	Coke Plant MD-07-51	Coke Plant MD-08-63
VOLATILE ORGANICS								
CHLOROMETHANE	NA	10 U	10 U	10 U	310 UJ	25 UJ	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	***1 J***	310 U	25 U	10 U	10 U
CHLOROFORM	11 U	10 U	***11***	***2 J***	310 U	25 U	***1 J***	***1 J***
1,2-DICHLOROETHANE	10 U	10 U	10 U	10 U	310 U	25 U	10 U	10 U
1,1,1-TRICHLOROETHANE	11 U	10 U	10 U	10 U	310 U	25 U	10 U	10 U
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	310 U	25 U	10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	310 U	25 U	10 U	10 U
BENZENE	10 U	10 U	***5 J***	***35***	***1300***	***440***	***3 J***	***3 J***
TETRACHLOROETHENE	10 U	10 U	10 U	10 U	310 U	25 U	10 U	***2 J***
TOLUENE	10 U	10 U	***13***	10 UJ	***4100***	***12 J***	10 U	***2 J***
CHLOROBENZENE	10 U	10 U	10 U	***82***	***63 J***	25 U	***67***	***6 J***
ETHYL BENZENE	10 U	10 U	10 U	***5 J***	***170 J***	***4 J***	10 U	10 U
TOTAL XYLENES	10 U	10 U	10 U	17B	***600***	***59***	10 U	10 U
ACETONE	NA	10 UJ	***51***	10 UJ	***520***	25 U	10 U	***42***
CARBON DISULFIDE	NA	10 U	***3 J***	10 U	310 U	25 U	10 U	10 U
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	10 U	10 U	310 U	25 U	10 U	10 U
PESTICIDES								
ALPHA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
BETA-BHC	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA-BHC (LINDANE)	NA	NA	NA	NA	NA	NA	NA	NA
DELTA-BHC	NA	NA	NA	NA	NA	NA	NA	NA

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

NA = The chemical was not analyzed for.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-3 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant
Well ID:	MD-09-20
CHEMICAL	
VOLATILE ORGANICS	
CHLOROMETHANE	500 U
1,1-DICHLOROETHANE	500 U
CHLOROFORM	***280 J***
1,2-DICHLOROETHANE	500 U
1,1,1-TRICHLOROETHANE	500 U
CARBON TETRACHLORIDE	***480 J***
TRICHLOROETHENE	***70 J***
BENZENE	***320 J***
TETRACHLOROETHENE	***4100***
TOLUENE	***35000***
CHLOROBENZENE	***310 J***
ETHYL BENZENE	500 U
TOTAL XYLENES	500 U
ACETONE	500 UJ
CARBON DISULFIDE	500 U
1,2-DICHLOROETHENE (TOTAL)	***71 J***
PESTICIDES	
ALPHA-BHC	NA
BETA-BHC	NA
GAMMA-BHC (LINDANE)	NA
DELTA-BHC	NA

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

NA = The chemical was not analyzed for.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-4

1995 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-SH	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-DP	Coke Plant MW-04-SH	Coke Plant MW-04-DP
1,3-DICHLOROBENZENE	***20***	10 U	10 U	***2 J***	10 U	10 U	10 U	10 U
1,4-DICHLOROBENZENE	***54***	10 U	10 U	***20***	***15***	10 U	10 U	10 U
1,2-DICHLOROBENZENE	***10***	10 U	10 U	10 U	***11***	10 U	10 U	10 U
1,2,4-TRICHLORBENZENE	***30***	10 UJ	10 U	10 U	10 UJ	10 UJ	10 UJ	10 U
NAPHTHALENE	10 U	10 U	***1 J***	***36***	10 U	10 U	10 U	***3 J***
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ACENAPHTHENE	10 U	10 U	***6 J***	***5 J***	10 U	10 U	10 U	10 U
FLUORENE	10 U	10 U	***2 J***	***1 J***	10 U	10 U	10 U	10 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
PHENANTHRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	***8***
FLUORANTHENE	10 U	10 U	***3 J***	10 U	10 U	10 U	10 U	***8 J***
PYRENE	10 U	10 U	***2 J***	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL) PHTHALATE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO-A-PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
INDENO (1,2,3-CD) PYRENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(GHI)PERYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	***8 J***	10 U	10 U	10 U	10 U
PHENOL	10 U	10 U	10 U	***6 J***	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	***9 J***
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	***3 J***	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U	***7 J***	10 U	10 U	10 U	10 U
DIBENZOFURAN	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	***4 J***
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	***10***
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
CARBAZOLE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

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UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-4 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12	Coke Plant MD-07-51	Coke Plant MD-08-63
1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
1,4-DICHLOROBENZENE	10 U	10 U	10 U	***3 J***	100 U	10 U	***2 J***	10 U
1,2-DICHLOROBENZENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
1,2,4-TRICHLORBENZENE	10 U	10 U	10 U	10 U	100 U	10 UJ	10 UJ	10 U
NAPHTHALENE	10 U	10 U	10 U	***240***	***10000***	***120***	10 U	10 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	***12 J***	***4 J***	10 U	10 U
ACENAPHTHENE	10 U	10 U	10 U	***120***	***240***	***4 J***	***14***	10 U
FLUORENE	10 U	10 U	10 U	***74***	***150***	***1 J***	10 U	10 U
N-NITROSODIPHENYLAMINE	10 UJ	10 U	10 U	10 U	***11 J***	10 U	10 U	10 U
PHENANTHRENE	10 U	10 U	10 U	***25***	***170***	***1 J***	10 U	10 U
ANTHRACENE	10 U	10 U	10 U	***4 J***	***28 J***	10 U	10 U	10 U
DI-N-BUTYLPHTHALATE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
FLUORANTHENE	10 U	10 U	10 U	***3 J***	***37 J***	***2 J***	10 U	10 U
PYRENE	10 U	10 U	10 U	***2 J***	***35 J***	***1 J***	10 U	10 U
BIS(2-ETHYLHEXYL) PHTHALATE	10 UJ	10 U	10 U	10 U	100 UJ	10 U	10 U	10 U
BENZO(A)ANTHRACENE	10 U	10 U	10 U	10 U	***11 J***	10 U	10 U	10 U
CHRYSENE	10 U	10 U	10 U	10 U	***10 J***	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
BENZO-A-PYRENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
INDENO (1,2,3-CD) PYRENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
BENZO(GHI)PERYLENE	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U	10 U	***21 J***	10 U	10 U	10 U
PHENOL	10 U	10 U	10 U	10 U	***180***	***54***	10 U	10 U
2,4-DIMETHYLPHENOL	***1 J***	10 U	10 U	10 U	***110***	***95***	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	***750***	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 U	***22***	***1100 J***	***11***	10 U	10 U
DIBENZOFURAN	10 U	10 U	10 U	***34***	***150***	***2 J***	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	100 U	***74***	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	***68 J***	***24***	10 U	10 U
2,4,5-TRICHLOROPHENOL	10 U	25 U	25 U	25 U	250 U	25 U	25 U	25 U
CARBAZOLE	10 U	10 U	10 U	***2 J***	***280***	10 U	10 U	10 U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-4 (cont.)

1995 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant
Well ID:	MD-09-20
CHEMICAL	
1,3-DICHLOROBENZENE	200 U
1,4-DICHLOROBENZENE	***180 J***
1,2-DICHLOROBENZENE	***98 J***
1,2,4-TRICHLORBENZENE	200 U
NAPHTHALENE	200 U
2-CHLORONAPHTHALENE	200 U
ACENAPHTHYLENE	200 U
ACENAPHTHENE	200 U
FLUORENE	200 U
N-NITROSODIPHENYLAMINE	200 U
PHENANTHRENE	200 U
ANTHRACENE	200 U
DI-N-BUTYLPHTHALATE	200 U
FLUORANTHENE	200 U
PYRENE	200 U
BIS(2-ETHYLHEXYL) PHTHALATE	2300 U
BENZO(A)ANTHRACENE	200 U
CHRYSENE	200 U
BENZO(B)FLUORANTHENE	200 U
BENZO(K)FLUORANTHENE	200 U
BENZO-A-PYRENE	200 U
INDENO (1,2,3-CD) PYRENE	200 U
BENZO(GHI)PERYLENE	200 U
2-CHLOROPHENOL	200 U
PHENOL	200 U
2,4-DIMETHYLPHENOL	200 U
2,4-DICHLOROPHENOL	200 U
4-CHLORO-3-METHYLPHENOL	200 U
2-METHYLNAPHTHALENE	200 U
DIBENZOFURAN	200 U
2-METHYLPHENOL	***3100***
4-METHYLPHENOL	200 U
2,4,5-TRICHLOROPHENOL	500 U
CARBAZOLE	200 U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-5

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-05-SH	Upgradient MW-05-IN	Upgradient MW-06-SH	Upgradient MW-06-IN	Upgradient VC-10	Upgradient VC-11	Upgradient VC-12	Upgradient VC-12 (DUP.)
SILVER	2U	2U	2U	2U	2U	2U	2U	2U
ARSENIC	4U	4U	4U	7J	4U	4U	4U	5U
BARIUM	20	21	28	150	91	59	120	130
BERYLLIUM	1U	1U	1U	2U	1U	1U	1U	1U
CADMIUM	1U	1U	2J	1U	1U	1U	1U	1U
COBALT	1U	2U	2U	10J	7J	1U	1U	1U
CHROMIUM	11	14	2U	25	1U	1U	1U	1U
COPPER	4U	7U	26	20U	1U	1U	1U	1U
NICKEL	20U	20U	15	90	3U	2U	2U	2U
LEAD	4J	2U	2U	17	2U	2U	2U	2U
ANTIMONY	1U	1U	2U	2U	1U	1U	1U	1U
SELENIUM	4U	4U	4U	4UJ	4U	4U	4U	4U
VANADIUM	2U	2U	2U	21J	2U	2U	2U	2U
ZINC	20U	8U	36	94	6U	6U	7U	5U
MERCURY	0.10U	0.10U	0.10U	0.20U	0.10U	0.10U	0.10U	0.10U
ALUMINUM	530	260	30U	18000	50	55	40U	40U
MANGANESE	160	17	410	870	9100	310	2700	2700
CALCIUM	37000	55000	41000	64000	140000	110000	56000	57000
IRON	890	340	90UJ	27000	3800	100U	***30000***	***31000***
MAGNESIUM	3800	8300	6700	16000	7900	11000	11000	11000
SODIUM	3900	12000	12000	9700	7200	5800	***220000***	***220000***
POTASSIUM	1000	1200	2000	5500	490	870	5300	5400
CYANIDE	10U	10U	10UR	10U	10U	10U	10U	10U

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R = QC indicates that the data are unusable. Chemical may or may not be present.

S = The chemical was also detected in the water supply used to construct the well from which this sample was collected at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-5 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

CHEMICAL	Well Location: / Well ID:	Upgradient VC-13	Upgradient VC-14	Upgradient VC-15	Upgradient VC-32	Upgradient VC-33	Coke Plant MW-01-SH	Coke Plant MW-01-IN	Coke Plant MW-01-IN (DUP.)
SILVER		2U	2U	2U	2U	2U	2U	2U	2U
ARSENIC		7J	4U	4U	***30***	4U	7J	4U	4U
BARIUM		***3800***	67	270	180	50	140	57	57
BERYLLIUM		1U	1U	1U	1U	1U	1U	1U	1U
CADMIUM		1U	1U	1U	1U	1U	1U	1U	1U
COBALT		10J	1U	1U	13J	1U	***74***	1U	1U
CHROMIUM		2J	1U	1U	2J	1U	1U	1U	1U
COPPER		7U	1U	6U	7U	1U	1U	1U	1U
NICKEL		20U	2U	5U	7U	2U	2U	8J	8J
LEAD		2U	2U	5	3.4	2U	2U	2U	2U
ANTIMONY		1U	1U	2U	1U	4U	1U	1U	1U
SELENIUM		4UJ	4U	4UJ	4U	4UJ	***14J***	4U	4U
VANADIUM		5J	2U	2U	12J	4J	2U	2U	2U
ZINC		***120***	20U	60U	20U	10U	8J	4J	3J
MERCURY		0.20U	0.10U	0.20U	0.20U	0.20U	0.10U	0.10U	0.10U
ALUMINUM		2900	40U	2300	220	140	160U	80U	80U
MANGANESE		3100	320	49	3900	530	***77000***	490	490
CALCIUM		***1200000***	170000	120000	120000	150000	51000	120000	120000
IRON		***31000***	50U	1100	6800	150U	***41000***	290	300U
MAGNESIUM		***390000***	22000	33000	10000	17000	9700	24000	24000
SODIUM		***110000***	14000	23000	***94000***	48000	23000	7500	7300
POTASSIUM		4300	280U	5300	6300	1500	450	850	920
CYANIDE		10U	10U	10U	***170***	10U	10UR	10UR	10UR

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S = The chemical was also detected in the water supply used to construct the well from which this sample was collected at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-5 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-IN	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-IN	Coke Plant MW-03-DP	Coke Plant MW-04-SH
SILVER	2U	2U	2U	2U	2U	2U	2U	2U
ARSENIC	4U	4U	7J	***8J***	4U	4U	4U	4U
BARIUM	170	120	83	***3400***	46	260	160	35
BERYLLIUM	1U	1U	1U	1U	1U	1U	1U	1U
CADMIUM	1U	1U	1U	1U	1U	1U	1U	1U
COBALT	1U	2J	6J	2J	5J	3J	1U	14J
CHROMIUM	1U	2U	2U	1U	2U	23	1U	1J
COPPER	1U	1U	1U	1U	5U	7U	1U	1U
NICKEL	2U	2U	2U	3U	10U	8U	10U	4U
LEAD	2U	2U	2U	2U	2U	7	2U	2U
ANTIMONY	1U	3U	3U	1U	1U	1U	1U	1U
SELENIUM	4U	4U	4U	4UJ	4U	4U	4UJ	4U
VANADIUM	2U	2U	2U	2U	1J	2U	2U	2U
ZINC	1U	2J	2J	7U	20U	10U	3U	50U
MERCURY	0.10U	0.10U	0.10U	0.20U	0.20U	0.10U	0.20U	0.10U
ALUMINUM	40U	20U	120U	40U	140	190	40U	75
MANGANESE	1300	3400	4900	5900	3100	120	18	1600
CALCIUM	17000	160000	260000	***950000***	110000	***320000***	150000	110000
IRON	1300	970J	6400J	***63000***	240U	90U	750	1900
MAGNESIUM	34000	22000	36000	***240000***	12000	14000	88000	9900
SODIUM	11000	13000	50000	***280000***	49000	34000	61000	21000
POTASSIUM	1200	3100	2700	8900	4200	***30000***	13000	2500
CYANIDE	10UR	***14J***	10UJ	10U	***27***	10U	***29***	10U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-5 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-04-IN	Coke Plant MW-04-DP	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12
SILVER	2U	2U	2U	2U	2U	2U	2U	2U
ARSENIC	4U	4U	4U	4U	5J	4U	7U	***11***
BARIUM	160	99	45	70	230	92	***2600***	160
BERYLLIUM	1U	1U	1U	1U	1U	1U	1U	1J
CADMIUM	1U	1U	1U	1U	1J	1U	1U	1U
COBALT	21J	2U	13J	1J	2U	1U	1J	20J
CHROMIUM	1U	7J	1U	1U	16	1U	1U	8J
COPPER	2U	5U	7J	1U	6J	1U	1U	6J
NICKEL	10U	49	11J	2U	70	2U	2U	33J
LEAD	2U	5J	2U	2U	2U	2U	2U	6
ANTIMONY	1U	1U	1U	2U	1UJ	1U	1U	2U
SELENIUM	4U	4UJ	4U	4U	4U	4U	4U	***5J***
VANADIUM	2U	2U	2U	2U	2U	2U	2U	12J
ZINC	5U	20U	5J	1U	20U	1U	4J	42
MERCURY	0.10U	0.20U	0.1UJ	0.1UJ	0.20U	0.10U	0.10U	0.10U
ALUMINUM	40U	40U	140U	40U	77	50U	50U	5700
MANGANESE	6500	20U	3800	190	35	9500	***40000***	8800
CALCIUM	***1300000***	120000	130000	210000	130000	42000	***2700000***	***330000***
IRON	2000	190U	210U	240U	320	***37000***	***67000***	***110000***
MAGNESIUM	***120000***	45000	20000	22000	50000	7200	***380000***	81000
SODIUM	***110000***	45000	32000	62000	***180000***	***250000***	***270000***	***140000***
POTASSIUM	7200	12000	750	1100	9600	3000	6000	***23000***
CYANIDE	11S	10U	10UR	10UR	10UJ	10UR	10UR	***260J***

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TABLE 7-5 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-07-51	Coke Plant MD-08-63	Coke Plant MD-09-20	Coke Plant MD-09-20 (DUP.)	Coke Plant MW-07-SH	Coke Plant MW-07-IN	Downgradient MW-08-SH	Downgradient MW-08-IN
SILVER	2U	2U	2U	2U	2U	2U	2U	2U
ARSENIC	4U	4U	4U	4U	4U	4U	4U	4U
BARIUM	75	***410***	***880***	***860***	52	33	26	32
BERYLLIUM	1U	1U	***7***	***7***	1U	1U	1U	1U
CADMIUM	1U	1U	1U	1U	1U	1U	1J	1U
COBALT	1U	1J	***700***	***690***	1U	1U	1J	1U
CHROMIUM	1U	1J	17	17	1U	1U	1U	1U
COPPER	1U	1U	***31***	***30***	3J	1U	3U	1U
NICKEL	11J	3U	***130***	***130***	2U	2U	2U	2U
LEAD	2U	2U	***33***	***32***	2U	2U	3U	2U
ANTIMONY	1U	1U	1U	1U	3U	1U	1U	2U
SELENIUM	4U	4U	***8J***	***9J***	***7J***	4U	4U	4U
VANADIUM	2U	2U	2J	2J	2J	2U	2U	2U
ZINC	1U	7U	***700***	***680***	1U	1U	1J	1U
MERCURY	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U
ALUMINUM	40U	40U	***47000***	***46000***	70U	40U	50U	80U
MANGANESE	10000	2700	***51000***	***43000***	340	23	180	2J
CALCIUM	***1000000***	***370000***	120000	110000	110000	150000	16000	85000
IRON	19000	2900	***160000***	***160000***	160U	100	60U	80U
MAGNESIUM	***170000***	110000	22000	22000	20000	18000	1400	8400
SODIUM	30000	***80000***	***360000***	***320000***	24000	12000	12000	15000
POTASSIUM	6000	2200	3900	3800	1100	720	300	570
CYANIDE	***860J***	10U	10UR	10UR	***310J***	10UR	10UR	10UR

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TABLE 7-5 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - INORGANICS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Downgradient MW-09-SH	Downgradient MW-09-IN	Downgradient VC-34	Downgradient VC-35
SILVER	2U	2U	2U	2U
ARSENIC	4U	4U	4U	4U
BARIUM	54	75	38	29
BERYLLIUM	2J	1U	1U	1U
CADMIUM	1U	1U	1U	1U
COBALT	65	1U	8J	1U
CHROMIUM	1U	1U	1U	1U
COPPER	11	1U	1U	1U
NICKEL	25J	6U	2U	4U
LEAD	2U	2U	2U	2U
ANTIMONY	1U	2U	1U	1U
SELENIUM	4U	4UJ	4U	4U
VANADIUM	2U	2U	1J	10J
ZINC	47	5U	6U	7U
MERCURY	0.10U	0.20U	0.10U	0.10U
ALUMINUM	4300	58	62	1200
MANGANESE	4000	790	7200	2U
CALCIUM	33000	130000	270000	110000
IRON	30U	590	1700	60U
MAGNESIUM	4900	22000	16000	400
SODIUM	4500	39000	40000	42000
POTASSIUM	3800	2200	570	7800
CYANIDE	10UR	10U	***92***	10U

Data Qualifiers:

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R = QC indicates that the data are unusable. Chemical may or may not be present.

S = The chemical was also detected in the water supply used to construct the well from which this sample was collected at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-05-SH	Upgradient MW-05-IN	Upgradient MW-06-SH	Upgradient MW-06-IN	Upgradient VC-10	Upgradient VC-11	Upgradient VC-12	Upgradient VC-12 (DUP.)
VOLATILE ORGANICS								
CHLOROMETHANE	10U	***14***	10U	10U	14000U	10U	20U	14U
1,1-DICHLOROETHANE	10U	10U	10U	10U	14000U	10U	20U	14U
CHLOROFORM	10U	10U	3JSE	10U	14000U	10U	20U	14U
1,2-DICHLOROETHANE	10U	10U	10U	10U	14000U	10U	20U	14U
1,1,1-TRICHLOROETHANE	10U	10U	10U	10U	14000U	10U	20U	14U
CARBON TETRACHLORIDE	10U	10U	10U	10U	14000U	10U	20U	14U
TRICHLOROETHENE	10U	10U	10U	10U	14000U	10U	20U	14U
BENZENE	10U	10U	10U	10U	14000U	10U	***230***	***180***
TETRACHLOROETHENE	10U	10U	10U	10U	14000U	10U	20U	14U
TOLUENE	10UJ	2JME	10U	10UJ	***170000J***	10UJ	20UJ	2JE
CHLOROBENZENE	10U	10U	10U	10U	14000U	10U	***110***	***120***
ETHYL BENZENE	10U	10U	10U	10U	14000U	10U	***11J***	***13J***
TOTAL XYLENES	10U	10U	10U	10U	14000U	10U	***17J***	***20***
ACETONE	***54J***	***110J***	10U	10U	14000U	10U	20U	14U
CARBON DISULFIDE	10U	10U	10U	10U	14000U	10U	20U	14U
1,2-DICHLOROETHENE (TOTAL)	10U	10U	10U	10U	14000U	10U	20U	14U
PESTICIDES								
ALPHA-BHC	0.050U	0.050U	0.050U	0.050U	***2.4***	***0.013J***	0.050U	0.050U
BETA-BHC	0.050U	0.050U	0.050U	0.050U	0.48N	0.050U	0.050U	0.050U
GAMMA-BHC (LINDANE)	0.050U	0.050U	0.050U	0.050U	***0.20***	0.050U	0.050U	0.050U
DELTA-BHC	0.050U	0.050U	0.050U	0.050U	0.085N	0.050U	0.050U	0.050U

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S = The chemical was also detected in the water supply used to construct the well from which this sample was collected at a comparable concentration.

B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient VC-13	Upgradient VC-14	Upgradient VC-15	Upgradient VC-32	Upgradient VC-33	Coke Plant MW-01-SH	Coke Plant MW-01-IN	Coke Plant MW-01-IN (DUP.)
VOLATILE ORGANICS								
CHLOROMETHANE	150U	10U	10U	17U	10U	10U	10U	10U
1,1-DICHLOROETHANE	150U	10U	10U	17U	10U	10U	10U	10U
CHLOROFORM	150U	10U	10U	17U	10U	10U	10U	10U
1,2-DICHLOROETHANE	150U	10U	10U	17U	10U	10U	10U	10U
1,1,1-TRICHLOROETHANE	150U	10U	10U	17U	10U	10U	10U	10U
CARBON TETRACHLORIDE	150U	10U	10U	17U	10U	10U	10U	10U
TRICHLOROETHENE	150U	10U	10U	17U	10U	10U	10U	10U
BENZENE	***2600***	10U	10U	***210***	***2J***	10U	10U	10U
TETRACHLOROETHENE	150U	10U	10U	17U	10U	10U	1JM	1JM
TOLUENE	***1500J***	10UJ	10UJ	***120J***	10UJ	10U	50M	50M
CHLOROBENZENE	150U	10U	10U	***2J***	10U	10U	10U	10U
ETHYL BENZENE	***320***	10U	10U	***28***	***3J***	10U	10U	10U
TOTAL XYLENES	***940***	10U	10U	***110***	***2J***	10U	10U	10U
ACETONE	***1700J***	10U	10U	17U	10U	10U	10U	10U
CARBON DISULFIDE	150U	10U	10U	17U	10U	1JE	10U	10U
1,2-DICHLOROETHENE (TOTAL)	150U	10U	10U	17U	10U	10U	10U	10U
PESTICIDES								
ALPHA-BHC	0.050U	***0.16***	0.050U	***0.38***	0.050U	***2.9***	0.050U	0.050U
BETA-BHC	0.050U	***0.50***	0.050U	0.050U	0.050U	***4.7***	0.050U	0.050U
GAMMA-BHC (LINDANE)	0.050U	***0.027J***	0.050U	0.050U	0.050U	0.25U	0.050U	0.050U
DELTA-BHC	0.050U	0.050U	0.050U	0.090N	0.050U	***2.8***	0.050U	0.050U

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B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-IN	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-IN	Coke Plant MW-03-DP	Coke Plant MW-04-SH
VOLATILE ORGANICS								
CHLOROMETHANE	10U	10U	10U	66U	10U	10U	10U	10U
1,1-DICHLOROETHANE	10U	10U	10U	66U	10U	10U	10U	10U
CHLOROFORM	10U	10U	2JSE	66U	10U	2JSBE	10U	10U
1,2-DICHLOROETHANE	10U	10U	10U	66U	10U	10U	10U	10U
1,1,1-TRICHLOROETHANE	10U	10U	10U	66U	10U	10U	10U	10U
CARBON TETRACHLORIDE	10U	10U	10U	66U	10U	10U	10U	10U
TRICHLOROETHENE	10U	10U	10U	66U	10U	10U	10U	10U
BENZENE	10U	***5J***	10U	***160***	10U	10U	10U	10U
TETRACHLOROETHENE	10U	10U	10U	***28J***	10U	10U	10U	10U
TOLUENE	10U	10U	10U	66UJ	10UJ	10UJ	10UJ	10UJ
CHLOROBENZENE	10U	10U	***130***	***1100***	***8J***	10U	10U	10U
ETHYL BENZENE	10U	10U	10U	***19J***	10U	10U	10U	10U
TOTAL XYLENES	10U	10U	10U	***15J***	10U	10U	10U	10U
ACETONE	10U	10U	10U	66U	10U	***83J***	10U	10U
CARBON DISULFIDE	10U	10U	10U	66U	10U	10U	10U	10U
1,2-DICHLOROETHENE (TOTAL)	10U	10U	10U	66U	10U	10U	10U	10U
PESTICIDES								
ALPHA-BHC	0.050U	0.050U	0.050U	0.050U	0.0072JN	0.050U	0.050U	0.050U
BETA-BHC	0.050U	0.050U	0.050U	0.050U	***0.041J***	***0.061***	0.050U	0.050U
GAMMA-BHC (LINDANE)	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U
DELTA-BHC	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U

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E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-04-IN	Coke Plant MW-04-DP	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12
VOLATILE ORGANICS								
CHLOROMETHANE	10U	310U	10U	10U	10U	10U	100U	100UR
1,1-DICHLOROETHANE	10U	310U	10U	10U	10U	10U	100U	100U
CHLOROFORM	10U	310U	10U	10U	10U	10U	100U	100U
1,2-DICHLOROETHANE	10U	***220J***	10U	10U	10U	10U	100U	100U
1,1,1-TRICHLOROETHANE	10U	***92J***	10U	10U	10U	10U	100U	100U
CARBON TETRACHLORIDE	10U	310U	10U	10U	10U	10U	100U	100U
TRICHLOROETHENE	10U	***53J***	10U	10U	10U	10U	100U	100U
BENZENE	10U	310U	10U	10U	***1J***	***46***	***1400***	***1000***
TETRACHLOROETHENE	10U	***4800***	10U	10U	10U	10U	100U	100U
TOLUENE	10UJ	310UJ	10U	10U	4JE	10U	***1400***	***65***
CHLOROBENZENE	***38***	310U	10U	10U	10U	***190***	***88J***	100U
ETHYL BENZENE	10U	310U	10U	10U	10U	***9J***	***180***	***31J***
TOTAL XYLENES	10U	310U	10U	10U	***6J***	***28***	***500***	***550***
ACETONE	10U	***620J***	10U	10U	70U	10U	100U	100U
CARBON DISULFIDE	10U	310U	10U	10U	10U	10U	100U	100U
1,2-DICHLOROETHENE (TOTAL)	10U	310U	10U	10U	10U	10U	100U	100U
PESTICIDES								
ALPHA-BHC	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	***0.52***	0.050U
BETA-BHC	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U
GAMMA-BHC (LINDANE)	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U
DELTA-BHC	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U

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E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-07-51	Coke Plant MD-08-63	Coke Plant MD-09-20	Coke Plant MD-09-20 (DUP.)	Coke Plant MW-07-SH	Coke Plant MW-07-IN	Downgradient MW-08-SH	Downgradient MW-08-IN
VOLATILE ORGANICS								
CHLOROMETHANE	10U	10U	2500U	5000U	10U	10U	10U	10U
1,1-DICHLOROETHANE	10U	10U	2500U	5000U	10U	10U	10U	10U
CHLOROFORM	10U	10U	2500U	***540J***	10U	10U	10U	10U
1,2-DICHLOROETHANE	10U	10U	2500U	5000U	10U	10U	10U	10U
1,1,1-TRICHLOROETHANE	10U	10U	2500U	5000U	10U	10U	10U	10U
CARBON TETRACHLORIDE	10U	10U	2500U	***620J***	10U	10U	10U	10U
TRICHLOROETHENE	10U	10U	2500U	5000U	10U	10U	10U	10U
BENZENE	10U	10U	2500U	5000U	10U	10U	10U	10U
TETRACHLOROETHENE	10U	10U	***2700***	***10000***	10U	10U	10U	10U
TOLUENE	10U	10UJ	***27000***	***96000***	10U	10U	1JMBE	2JMBE
CHLOROBENZENE	***140***	10U	2500U	***690J***	10U	10U	10U	10U
ETHYL BENZENE	10U	10U	2500U	5000U	10U	10U	10U	10U
TOTAL XYLENES	10U	***1J***	2500U	5000U	10U	10U	10U	10U
ACETONE	10U	10U	2500U	5000U	10U	10U	10U	10U
CARBON DISULFIDE	10U	3JE	2500U	5000U	10U	10U	10U	10U
1,2-DICHLOROETHENE (TOTAL)	10U	10U	2500U	5000U	10U	10U	10U	10U
PESTICIDES								
ALPHA-BHC	0.050U	***0.0053J***	***6.9***	6.1N	0.050U	0.050U	0.050U	0.050U
BETA-BHC	0.050U	***0.011J***	0.050U	0.7U	0.050U	0.050U	0.050U	0.050U
GAMMA-BHC (LINDANE)	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U
DELTA-BHC	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U	0.050U

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E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-6 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - VOCS/PESTICIDES
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Downgradient	Downgradient	Downgradient	Downgradient
Well ID:	MW-09-SH	MW-09-IN	VC-34	VC-35
CHEMICAL				
VOLATILE ORGANICS				
CHLOROMETHANE	10U	1.0U	10U	10U
1,1-DICHLOROETHANE	10U	1.0U	10U	10U
CHLOROFORM	1JSE	1.0U	10U	10U
1,2-DICHLOROETHANE	10U	0.66JB	10U	10U
1,1,1-TRICHLOROETHANE	10U	1.0U	10U	10U
CARBON TETRACHLORIDE	10U	1.0U	10U	10U
TRICHLOROETHENE	10U	1.0U	10U	10U
BENZENE	10U	1.0U	10U	10U
TETRACHLOROETHENE	10U	1.0U	10U	10U
TOLUENE	10U	1.0U	10UJ	***33J***
CHLOROBENZENE	10U	1.0U	10U	10U
ETHYL BENZENE	10U	1.0U	10U	10U
TOTAL XYLENES	10U	2.0U	10U	10U
ACETONE	10U	25U	10U	10U
CARBON DISULFIDE	10U	2.5U	10U	10U
1,2-DICHLOROETHENE (TOTAL)	10U	2.0U	10U	10U
PESTICIDES				
ALPHA-BHC	0.050U	0.050U	***0.52***	0.050U
BETA-BHC	0.050U	0.050U	***0.13***	0.09U
GAMMA-BHC (LINDANE)	0.050U	0.050U	***0.054***	0.050U
DELTA-BHC	0.050U	0.050U	***0.020J***	0.050U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-05-SH	Upgradient MW-05-IN	Upgradient MW-06-SH	Upgradient MW-06-IN	Upgradient VC-10	Upgradient VC-11	Upgradient VC-12	Upgradient VC-12 (DUP.)
1,3-DICHLOROBENZENE	10U	10U	10UJ	10UJ	10U	10U	10U	10U
1,4-DICHLOROBENZENE	10U	10U	10U	10UJ	10U	10U	***1J***	***1J***
1,2-DICHLOROBENZENE	10U	10U	10U	10UJ	10U	10U	10U	10U
1,2,4-TRICHLORBENZENE	10U	10U	10U	10UJ	10U	10U	10U	10U
NAPHTHALENE	10UJ	10UJ	10U	10UJ	***3J***	10UJ	***600J***	***670J***
2-CHLORONAPHTHALENE	10U	10U	10U	10UJ	10U	10U	10U	10U
ACENAPHTHYLENE	10U	10U	10U	10UJ	10U	10U	10U	10U
ACENAPHTHENE	10U	10U	10U	10UJ	10U	10U	***70***	***78***
FLUORENE	10U	10U	10U	10UJ	10U	10U	***28***	***30***
N-NITROSODIPHENYLAMINE	10U	10U	10U	10UJ	10U	10U	10U	10U
PHENANTHRENE	10UR	10UR	10U	10UR	10UR	10UR	***40J***	***41J***
ANTHRACENE	10U	10U	10U	10UJ	10U	10U	***3J***	***4J***
DI-N-BUTYLPHTHALATE	10U	10U	10U	10UJ	10U	10U	10U	10U
FLUORANTHENE	10UJ	10UJ	10U	10UJ	10UJ	10UJ	***6J***	***7J***
PYRENE	10U	10U	10UR	10UJ	10U	10U	***5J***	***6J***
BIS(2-ETHYLHEXYL) PHTHALATE	10U	10U	10U	10UJ	10U	10U	10U	10U
BENZO(A)ANTHRACENE	10U	10U	10U	10UJ	10U	10U	10U	10U
CHRYSENE	10U	10U	10U	10UJ	10U	10U	10U	10U
BENZO(B &/OR K)FLUORANTHENE	10U	10U	10U	10UJ	10U	10U	10U	10U
BENZO-A-PYRENE	10U	10U	10U	10UJ	10U	10U	10U	10U
INDENO (1,2,3-CD) PYRENE	10U	10U	10U	10UJ	10U	10U	10U	10U
BENZO(GHI)PERYLENE	10U	10U	10U	10UJ	10U	10U	10U	10U
2-CHLOROPHENOL	10U	10U	10UR	10UJ	10U	10U	10U	10U
PHENOL	10U	10U	10U	10UJ	10U	10U	***3J***	***4J***
2,4-DIMETHYLPHENOL	10U	10U	10U	10UJ	10U	10U	***26***	***30***
2,4-DICHLOROPHENOL	10U	10U	10U	10UJ	10U	10U	10U	10U
4-CHLORO-3-METHYLPHENOL	10U	10U	10U	10UJ	10U	10U	10U	10U
2-METHYLNAPHTHALENE	10U	10U	10U	10UJ	10U	10U	***25***	***28***
DIBENZOFURAN	10U	10U	10U	10UJ	10U	10U	***42***	***46***
2-METHYLPHENOL	10U	10U	10U	10UJ	***2J***	10U	***5J***	***6J***
(3- AND/OR 4-)METHYLPHENOL	10U	10U	10U	10UJ	10U	10U	10U	10U
2,4,5-TRICHLOROPHENOL	25U	25U	25UJ	25UJ	25U	25U	25U	25U
CARBAZOLE	10U	10U	10U	10UJ	10U	10U	***5J***	***6J***

Data Qualifiers:

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J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

R = QC indicates that the data are unusable. Chemical may or may not be present.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient VC-13	Upgradient VC-14	Upgradient VC-15	Upgradient VC-32	Upgradient VC-33	Coke Plant MW-01-SH	Coke Plant MW-01-IN	Coke Plant MW-01-IN (DUP.)
1,3-DICHLOROBENZENE	50UJ	10U	10U	10U	10U	***15J***	10UJ	10UJ
1,4-DICHLOROBENZENE	50UJ	10U	10U	10U	10U	***46***	10U	10U
1,2-DICHLOROBENZENE	50UJ	10U	10U	10U	10U	***8J***	10U	10U
1,2,4-TRICHLORBENZENE	50UJ	10U	10U	10U	10U	***18***	10U	10U
NAPHTHALENE	50UJ	10UJ	10UJ	***900J***	***42J***	10U	10U	10U
2-CHLORONAPHTHALENE	50UJ	10U	10U	10U	10U	10U	10U	10U
ACENAPHTHYLENE	***64J***	10U	10U	***10***	10U	10U	10U	10U
ACENAPHTHENE	***320J***	10U	10U	***25***	***14***	10U	10U	10U
FLUORENE	***370J***	10U	10U	***35***	***19***	10U	10U	10U
N-NITROSODIPHENYLAMINE	50UJ	10U	10U	10U	10U	10U	10U	10U
PHENANTHRENE	***490J***	10UR	10UR	***29J***	***4J***	10U	10U	10U
ANTHRACENE	***140J***	10U	10U	***4J***	10U	10U	10U	10U
DI-N-BUTYLPHTHALATE	50UJ	10U	10U	10U	10U	10U	10U	10U
FLUORANTHENE	***330J***	10UJ	10UJ	***8J***	***1J***	10U	10U	10U
PYRENE	***250J***	10U	10U	***8J***	10U	10UR	10UR	10UR
BIS(2-ETHYLHEXYL) PHTHALATE	***500J***	10U	10U	10U	10U	10U	10U	10U
BENZO(A)ANTHRACENE	***120J***	10U	10U	10U	10U	10U	10U	10U
CHRYSENE	***98J***	10U	10U	10U	10U	10U	10U	10U
BENZO(B &/OR K)FLUORANTHENE	***110J***	10U	10U	***1J***	10U	10U	10U	10U
BENZO-A-PYRENE	***82J***	10U	10U	10U	10U	10U	10U	10U
INDENO (1,2,3-CD) PYRENE	***49J***	10U	10U	10U	10U	10U	10U	10U
BENZO(GHI)PERYLENE	***56J***	10U	10U	10U	10U	10U	10U	10U
2-CHLOROPHENOL	50UJ	10U	10U	10U	10U	10UR	10UR	10UR
PHENOL	***2200J***	10U	10U	***200***	10U	10U	10U	10U
2,4-DIMETHYLPHENOL	***2000J***	10U	10U	***180J***	10U	10U	10U	10U
2,4-DICHLOROPHENOL	50UJ	10U	10U	10U	10U	10U	10U	10U
4-CHLORO-3-METHYLPHENOL	50UJ	10U	10U	10U	10U	10U	10U	10U
2-METHYLNAPHTHALENE	***1100J***	10U	10U	***100J***	***6J***	10U	10U	10U
DIBENZOFURAN	***250J***	10U	10U	***22***	***9J***	10U	10U	10U
2-METHYLPHENOL	***1100J***	10U	10U	***110J***	10U	10U	10U	10U
(3- AND/OR 4-)METHYLPHENOL	***2000J***	10U	10U	***180J***	10U	10U	10U	10U
2,4,5-TRICHLOROPHENOL	120UJ	25U	25U	25U	25U	25UJ	25UJ	25UJ
CARBAZOLE	***330J***	10U	10U	***120J***	***2J***	10U	10U	10U

Data Qualifiers:

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UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

R = QC indicates that the data are unusable. Chemical may or may not be present.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-01-DP	Coke Plant MW-02-SH	Coke Plant MW-02-IN	Coke Plant MW-02-DP	Coke Plant MW-03-SH	Coke Plant MW-03-IN	Coke Plant MW-03-DP	Coke Plant MW-04-SH
1,3-DICHLOROBENZENE	10UJ	10UJ	***2J***	10U	10U	10U	10U	10U
1,4-DICHLOROBENZENE	10U	10U	10U	***18***	***1J***	10U	10U	10U
1,2-DICHLOROBENZENE	10U	10U	10U	10U	***1J***	10U	10U	10U
1,2,4-TRICHLORBENZENE	10U	10U	10U	10U	10U	10U	10U	10U
NAPHTHALENE	10U	10U	10U	***11J***	10UJ	10UJ	10UJ	10UJ
2-CHLORONAPHTHALENE	10U	10U	10U	10U	10U	10U	10U	10U
ACENAPHTHYLENE	10U	10U	10U	10U	10U	10U	10U	10U
ACENAPHTHENE	10U	10U	***100***	***3J***	10U	10U	10U	10U
FLUORENE	10U	10U	***1J***	***1J***	10U	10U	10U	10U
N-NITROSODIPHENYLAMINE	10U	10U	10U	10U	10U	10U	10U	10U
PHENANTHRENE	10U	10U	10U	10UR	10UR	10UR	10UR	10UR
ANTHRACENE	10U	10U	10U	10U	10U	10U	10U	10U
DI-N-BUTYLPHTHALATE	10U	10U	10U	10U	10U	10U	10U	10U
FLUORANTHENE	10U	10U	10U	10UJ	10UJ	10UJ	10UJ	10UJ
PYRENE	10UR	10UR	10UR	10U	10U	10U	10U	10U
BIS(2-ETHYLHEXYL) PHTHALATE	10U	10U	20U	10U	10U	10U	10U	10U
BENZO(A)ANTHRACENE	10U	10U	10U	10U	10U	10U	10U	10U
CHRYSENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO(B &/OR K)FLUORANTHENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO-A-PYRENE	10U	10U	10U	10U	10U	10U	10U	10U
INDENO (1,2,3-CD) PYRENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO(GHI)PERYLENE	10U	10U	10U	10U	10U	10U	10U	10U
2-CHLOROPHENOL	10UR	10UR	10UJ	***8J***	10U	10U	10U	10U
PHENOL	10U	10U	10U	***3J***	10U	10U	10U	10U
2,4-DIMETHYLPHENOL	10U	10U	10U	10U	10U	10U	10U	10U
2,4-DICHLOROPHENOL	10U	10U	10U	10U	10U	10U	10U	10U
4-CHLORO-3-METHYLPHENOL	10U	10U	10U	***2J***	10U	10U	10U	10U
2-METHYLNAPHTHALENE	10U	10U	10U	***2J***	10U	10U	10U	10U
DIBENZOFURAN	10U	10U	10U	10U	10U	10U	10U	10U
2-METHYLPHENOL	10U	10U	10U	10U	10U	10U	10U	10U
(3- AND/OR 4-)METHYLPHENOL	10U	10U	10U	10U	10U	10U	10U	10U
2,4,5-TRICHLOROPHENOL	25UJ	25UJ	25UJ	25U	25U	25U	25U	25U
CARBAZOLE	10U	10U	10U	10U	10U	10U	10U	10U

Data Qualifiers:

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UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

R = QC indicates that the data are unusable. Chemical may or may not be present.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MW-04-IN	Coke Plant MW-04-DP	Coke Plant MD-05-12	Coke Plant MD-05-20	Coke Plant MD-05-102	Coke Plant MD-06-14	Coke Plant MD-06-73	Coke Plant MD-07-12
1,3-DICHLOROBENZENE	10U	10U	10UJ	10UJ	10U	10UJ	200UJ	50UJ
1,4-DICHLOROBENZENE	***2J***	10U	10U	10U	10U	***3J***	200U	50U
1,2-DICHLOROBENZENE	10U	10U	10U	10U	10U	10U	200U	50U
1,2,4-TRICHLORBENZENE	10U	10U	10U	10U	10U	10U	200U	50U
NAPHTHALENE	10UJ	10UJ	10U	10U	10UJ	***380***	***6100***	***370***
2-CHLORONAPHTHALENE	10U	10U	10U	10U	10U	10U	200U	50U
ACENAPHTHYLENE	10U	10U	10U	10U	10U	10U	200U	***10J***
ACENAPHTHENE	10U	10U	10U	10U	10U	***79***	***240***	50U
FLUORENE	10U	10U	10U	10U	10U	***71***	***150J***	***6J***
N-NITROSODIPHENYLAMINE	10U	10U	10U	10U	10U	10U	200U	50U
PHENANTHRENE	10UR	10UR	10U	10U	10U	***34***	***140J***	50U
ANTHRACENE	10U	10U	10U	10U	10UR	***7J***	200U	50U
DI-N-BUTYLPHTHALATE	10U	10U	10U	10U	10U	10U	200U	50U
FLUORANTHENE	10UJ	10UJ	10U	10U	10U	***11***	200U	50U
PYRENE	10U	10U	10UR	10UR	10UJ	***7J***	200UR	50UR
BIS(2-ETHYLHEXYL) PHTHALATE	10U	10U	10U	10U	10U	10U	200U	50U
BENZO(A)ANTHRACENE	10U	10U	10U	10U	10U	10U	200U	50U
CHRYSENE	10U	10U	10U	10U	10U	10U	200U	50U
BENZO(B &/OR K)FLUORANTHENE	10U	10U	10U	10U	10U	10U	200U	50U
BENZO-A-PYRENE	10U	10U	10U	10U	10U	10U	200U	50U
INDENO (1,2,3-CD) PYRENE	10U	10U	10U	10U	10U	10U	200U	50U
BENZO(GHI)PERYLENE	10U	10U	10U	10U	10U	10U	200U	50U
2-CHLOROPHENOL	10U	10U	10UR	10UR	10U	10UR	200UR	50UR
PHENOL	10U	10U	10U	10U	10U	10U	***440***	***100***
2,4-DIMETHYLPHENOL	10U	10U	10U	10U	10U	10U	***50J***	***100***
2,4-DICHLOROPHENOL	10U	10U	10U	10U	10U	10U	200U	50U
4-CHLORO-3-METHYLPHENOL	10U	10U	10U	10U	10U	10U	200U	50U
2-METHYLNAPHTHALENE	10U	10U	10U	10U	10U	***37***	***810***	***29J***
DIBENZOFURAN	10U	10U	10U	10U	10U	***36***	***150J***	50U
2-METHYLPHENOL	10U	10U	10U	10U	10UJ	10U	***36J***	***79***
(3- AND/OR 4-)METHYLPHENOL	10U	10U	10U	10U	***53***	10U	***44J***	***60***
2,4,5-TRICHLOROPHENOL	25U	25U	25UJ	***25J***	25U	25UJ	500UJ	120UJ
CARBAZOLE	10U	10U	10U	10U	10U	***8J***	***260***	50U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Coke Plant MD-07-51	Coke Plant MD-08-63	Coke Plant MD-09-20	Coke Plant MD-09-20 (DUP.)	Coke Plant MW-07-SH	Coke Plant MW-07-IN	Downgradient MW-08-SH	Downgradient MW-08-IN
1,3-DICHLOROBENZENE	10UJ	10U	10UJ	10UJ	10UJ	10UJ	10UJ	10UJ
1,4-DICHLOROBENZENE	10U	10U	***110***	110UJ	10U	10U	10U	10U
1,2-DICHLOROBENZENE	10U	10U	40U	***41***	10U	10U	10U	10U
1,2,4-TRICHLORBENZENE	10U	10U	10U	10U	10U	10U	10U	10UJ
NAPHTHALENE	***2J***	10UJ	10U	10U	10U	10U	10U	10UJ
2-CHLORONAPHTHALENE	10U	10U	10U	10U	10U	10U	10U	10U
ACENAPHTHYLENE	10U	10U	10U	10U	10U	10U	10U	10U
ACENAPHTHENE	***17***	10U	10U	10U	10U	10U	10U	10U
FLUORENE	10U	10U	10U	10U	10U	10U	10U	10U
N-NITROSODIPHENYLAMINE	10U	10U	10U	10U	10U	10U	10U	10U
PHENANTHRENE	10U	10UR	10U	10U	10U	10U	10U	10U
ANTHRACENE	10U	10U	10U	10U	10U	10U	10U	10U
DI-N-BUTYLPHTHALATE	10U	10U	10U	10U	10U	10U	10U	10U
FLUORANTHENE	10U	10UJ	10U	10U	10U	10U	10U	10U
PYRENE	10UR	10U	10UR	10UR	10UR	10UR	10UR	10UR
BIS(2-ETHYLHEXYL) PHTHALATE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO(A)ANTHRACENE	10U	10U	10U	10U	10U	10U	10U	10U
CHRYSENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO(B &/OR K)FLUORANTHENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO-A-PYRENE	10U	10U	10U	10U	10U	10U	10U	10U
INDENO (1,2,3-CD) PYRENE	10U	10U	10U	10U	10U	10U	10U	10U
BENZO(GHI)PERYLENE	10U	10U	10U	10U	10U	10U	10U	10U
2-CHLOROPHENOL	10UR	10U	10UR	10UR	10UR	10UR	10UR	10UR
PHENOL	10U	10U	10U	10U	10U	10U	10U	10U
2,4-DIMETHYLPHENOL	10U	10U	10U	10U	10U	10U	10U	10UJ
2,4-DICHLOROPHENOL	10U	10U	10U	10U	10U	10U	10U	10UJ
4-CHLORO-3-METHYLPHENOL	10U	10U	20U	20U	10U	10U	10U	10UJ
2-METHYLNAPHTHALENE	10U	10U	10U	10U	10U	10U	10U	10UJ
DIBENZOFURAN	10U	10U	10U	10U	10U	10U	10U	10U
2-METHYLPHENOL	10U	10U	10U	10U	10U	10U	10U	10U
(3- AND/OR 4-)METHYLPHENOL	10U	10U	***25J***	***640J***	10U	10U	10U	10U
2,4,5-TRICHLOROPHENOL	25UJ	25U	25UJ	25UJ	25UJ	25UJ	***25J***	25UJ
CARBAZOLE	10U	10U	10U	10U	10U	10U	10U	10U

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-7 (cont.)

1996 GROUNDWATER SAMPLING SUMMARY - SVOCS
COKE PLANT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Downgradient MW-09-SH	Downgradient MW-09-IN	Downgradient VC-34	Downgradient VC-35
1,3-DICHLOROBENZENE	10UJ	10U	10U	10U
1,4-DICHLOROBENZENE	10U	10U	10U	10U
1,2-DICHLOROBENZENE	10U	10U	10U	10U
1,2,4-TRICHLORBENZENE	10U	10U	10U	10U
NAPHTHALENE	10U	10UJ	10UJ	***8J***
2-CHLORONAPHTHALENE	10U	10U	10U	***10J***
ACENAPHTHYLENE	10U	10U	10U	10U
ACENAPHTHENE	10U	10U	10U	***2J***
FLUORENE	10U	10U	10U	***2J***
N-NITROSODIPHENYLAMINE	10U	10U	10U	10U
PHENANTHRENE	10U	10UR	10UR	***2J***
ANTHRACENE	10U	10U	10U	10U
DI-N-BUTYLPHTHALATE	10U	10U	10U	10U
FLUORANTHENE	10U	10UJ	10UJ	10UJ
PYRENE	10UR	10U	10U	10U
BIS(2-ETHYLHEXYL) PHTHALATE	10U	10U	10U	10U
BENZO(A)ANTHRACENE	10U	10U	10U	10U
CHRYSENE	10U	10U	10U	10U
BENZO(B &/OR K)FLUORANTHENE	10U	10U	10U	10U
BENZO-A-PYRENE	10U	10U	10U	10U
INDENO (1,2,3-CD) PYRENE	10U	10U	10U	10U
BENZO(GHI)PERYLENE	10U	10U	10U	10U
2-CHLOROPHENOL	10UR	10U	10U	10U
PHENOL	10U	10U	10U	10U
2,4-DIMETHYLPHENOL	10U	10U	10U	10U
2,4-DICHLOROPHENOL	10U	10U	10U	10U
4-CHLORO-3-METHYLPHENOL	10U	10U	10U	10U
2-METHYLNAPHTHALENE	10U	10U	10U	***3J***
DIBENZOFURAN	10U	10U	10U	***2J***
2-METHYLPHENOL	10U	10U	10U	10U
(3- AND/OR 4-)METHYLPHENOL	10U	10U	10U	10U
2,4,5-TRICHLOROPHENOL	25UJ	25U	25U	25U
CARBAZOLE	10U	10U	10U	10U

Data Qualifiers:

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J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

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TABLE 7-8

GROUNDWATER SAMPLING SUMMARY - INORGANICS
SCHWERMAN TRUCKING SITE
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-10-SH	Upgradient MW-10-IN	Downgradient MW-11-SH	Downgradient MW-11-IN	Downgradient MW-11-IN (DUP.)
ARSENIC	4U	4U	***30***	***9J***	10U
BARIUM	95	130	160	100	100
BERYLLIUM	1U	1U	***4J***	1U	1U
CADMIUM	1U	1U	***14***	1J	1J
COBALT	38	2J	***210***	2U	2U
CHROMIUM	3J	1U	23	2U	2U
COPPER	3U	1U	5J	1U	1U
NICKEL	85	6U	***47000***	5J	5J
LEAD	2U	2U	6	2U	2U
VANADIUM	2U	1J	***67***	2U	2U
ZINC	20U	8U	***900***	3J	3J
ALUMINUM	51	20U	***38000***	40U	100U
MANGANESE	2700	320	15000	1500	1500
CALCIUM	35000	100000	19000	160000	160000
IRON	8800	26000	***460000***	11000J	11000J
MAGNESIUM	5200	23000	66000	8600	8700
SODIUM	16000	26000	***130000***	15000	15000
POTASSIUM	1500	1600	4300	880	920

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Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-9

GROUNDWATER SAMPLING SUMMARY - ORGANICS
SCHWERMAN TRUCKING SITE
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-10-SH	Upgradient MW-10-IN	Downgradient MW-11-SH	Downgradient MW-11-IN	Downgradient MW-11-IN (DUP.)
VOLATILE ORGANICS					
ACETONE	10U	10U	***2200***	300U	340U
METHYL ETHYL KETONE	10U	10U	***1800***	10U	10U
METHYL BUTYL KETONE	10U	10U	***290***	10U	10U

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-10

GROUNDWATER SAMPLING SUMMARY - INORGANICS
CHATTANOOGA CREEK TAR DEPOSIT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-12-SH	Upgradient MW-12-IN	Downgradient MW-13-SH	Downgradient MW-16-SH	Downgradient MW-16-SH (DUP.)
BARIUM	26	15	34	34	33
CADMIUM	2J	1U	1U	1U	1U
COBALT	5J	2U	2J	2U	2U
CHROMIUM	2U	2U	2U	2J	2J
COPPER	4J	1U	5J	9J	10J
NICKEL	13J	5U	12J	6J	6J
VANADIUM	2U	2U	2U	1J	2U
ZINC	13J	2J	9J	8J	7J
ALUMINUM	130U	180U	730	1000	690U
MANGANESE	80	180	260	120	120
CALCIUM	2900	53000	18000	20000	20000
IRON	60UJ	380UJ	920J	1300J	950J
MAGNESIUM	850	5200	2300	2500	2500
SODIUM	4900	14000	3600	4200	4300
POTASSIUM	1500	580	760	980	940

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-11

GROUNDWATER SAMPLING SUMMARY - ORGANICS
CHATTANOOGA CREEK TAR DEPOSIT AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient MW-12-SH	Upgradient MW-12-IN	Downgradient MW-13-SH	Downgradient MW-16-SH	Downgradient MW-16-SH (DUP.)
VOLATILE ORGANICS					
CHLOROFORM	10U	4JSBE	10U	10U	10U
TETRACHLOROETHENE	10U	1JM	10U	10U	10U
SEMIVOLATILE ORGANICS					
2,4,5-TRICHLOROPHENOL	25UJ	25UJ	***25J***	25UJ	25UJ

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

M = The chemical was also detected in the drilling materials used to construct the well from which this sample was collected.

S = The chemical was also detected in the water supply used to construct the well from which this sample was collected at a comparable concentration.

B = The chemical was also detected in the trip blank associated with the sample at a comparable concentration.

E = The chemical was also detected in equipment rinsate potentially associated with the sample at a comparable concentration.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-12

GROUNDWATER SAMPLING SUMMARY - INORGANICS
CHATTANOOGA CREEK SEDIMENTS AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Downgradient MW-14-SH	Downgradient MW-15-SH
BARIUM	63	85
COBALT	5J	3J
CHROMIUM	2U	1J
ALUMINUM	150	55
MANGANESE	1300	1200
CALCIUM	47000	49000
IRON	***32000***	***36000***
MAGNESIUM	3600	7700
SODIUM	6200	11000
POTASSIUM	580	1500

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

TABLE 7-13

GROUNDWATER SAMPLING SUMMARY - ORGANICS
CHATTANOOGA CREEK SEDIMENTS AREA
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Downgradient MW-14-SH	Downgradient MW-15-SH
VOLATILE ORGANICS		
BENZENE	54JM	36U
CHLOROBENZENE	***810***	***520***
PESTICIDES		
ALPHA-BHC	***0.10***	0.050U
BETA-BHC	***0.069***	***0.11***
GAMMA-BHC (LINDANE)	***0.020J***	0.050U
DIELDRIN	***0.015J***	0.10U
SEMIVOLATILE ORGANICS		
1,3-DICHLOROBENZENE	10U	***1J***
1,4-DICHLOROBENZENE	***1J***	10U
NAPHTHALENE	***15J***	***7J***
ACENAPHTHENE	***5J***	***53***
PHENANTHRENE	10UR	2JM
2-METHYLNAPHTHALENE	1JM	6JM

Data Qualifiers:

U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.

J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.

R = QC indicates that the data are unusable. Chemical may or may not be present.

M = The chemical was also detected in the drilling materials used to construct the well from which this sample was collected.

Concentrations presented in ug/L. Concentrations printed in bold italicized text are considered to reflect a valid detection of unnatural contamination.

7.3.1 BACKGROUND

To estimate the naturally occurring background concentrations for inorganic chemicals in groundwater, a statistical analysis was performed on the inorganic chemical data obtained from the groundwater samples collected from the following 12 monitor wells:

• MW-05-SH	• MW-08-SH	• MW-10-SH
• MW-05-IN	• MW-08-IN	• MW-10-IN
• MW-06-SH	• MW-09-SH	• MW-12-SH
• MW-06-IN	• MW-09-IN	• MW-12-IN

These wells were selected for use in the background statistical analysis based on the following observations:

- Monitor well cluster MW-05 was originally designated as a background well cluster, and is located upgradient of the TP Site as well as all other known potential sources of contamination in the area
- Monitor well cluster MW-06 is located upgradient of the TP Site and no organic contamination was detected in either of the two wells in this cluster
- While monitor well cluster MW-08 is located downgradient of the coke plant, it is not located in any of the TP source areas and no significant organic contamination was found in either of the two wells located in this cluster
- While monitor well cluster MW-09 is located downgradient of the coke plant, it is not located in any of the TP source areas and no organic contamination was found in either of the two wells located in this cluster
- Monitor well cluster MW-10 is located upgradient of Schwerman Trucking Site and no organic contamination was detected in either of the two wells in this cluster
- Monitor well cluster MW-12 is located upgradient of the Chattanooga Creek Tar Deposit and no organic contamination was detected in either of the two wells in this cluster

Using the background data set indicated above, arithmetic average background concentrations were first calculated for each inorganic analyte. For those analytes where one or more of the concentration measurements was a nondetect, half the detection limit was used to calculate the average concentration. The results of the average background concentration calculations are presented in **Table 7-14**.

The background inorganic data were then evaluated by the statistical methods suggested in EPA guidance documents and publications (EPA 1989, EPA 1992d, and EPA 1995) to determine the 95% confidence upper limit background concentration for each inorganic analyte. As specified in the EPA guidance documents, to calculate the 95% confidence upper limit background concentration, the data set for each analyte was first placed into one of three categories: no detections, #50% detections, and >50% detections. For analytes with no detections, the upper limit background concentration was assumed to be the highest detection limit for that analyte in the data set. For analytes with #50% detections, the upper limit background concentration was assumed to be the highest concentration measured for that analyte in the data set. For analytes with >50% detections, the upper limit background concentration was calculated according to the statistical procedure specified in the EPA guidance documents. The results of the 95% confidence upper limit background concentration statistical determinations are presented in Table 7-14.

Since organic chemicals are not believed to be naturally occurring in groundwater in the Chattanooga area, the upper limit background concentrations for all organic chemicals in groundwater are assumed to be zero.

7.3.2 COKE PLANT

As indicated in Tables 7-2 through 7-7, a wide variety of chemicals were detected in the groundwater samples collected from monitor wells on or near the coke plant property. The spectrum of chemicals detected in at least one groundwater sample from this area included

TABLE 7-14

ESTIMATED AVERAGE AND UPPER LIMIT (95% CONFIDENCE) BACKGROUND CONCENTRATIONS FOR INORGANICS IN GROUNDWATER TENNESSEE PRODUCTS SITE CHATTANOOGA, TENNESSEE

Chemical	Average Background Concentration (ug/l)	Estimated Upper Limit (95% Confidence) Background Concentration (ug/l)[a]
Silver	ND (2)[b]	ND (2)
Arsenic	ND (4)	7
Barium	56	360
Beryllium	ND (1)	2
Cadmium	ND (1)	2
Cobalt	10	65
Chromium	5	25
Copper	5	26
Nickel	22	90
Lead	3	17
Antimony	ND (3)	ND (3)
Selenium	ND (4)	ND (4)
Vanadium	3	21
Zinc	19	94
Mercury	ND (0.20)	ND (0.20)
Aluminum	2000	18000
Manganese	810	19000
Calcium	54000	270000
Iron	5300	27000
Magnesium	14000	92000
Sodium	14000	75000
Potassium	1800	13000
Cyanide	ND (10)	ND (10)

[a] Calculated using the methods described in *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (EPA, 1992d) and the inorganic groundwater concentration data collected from the following 12 monitor wells:

MW-05-SH	MW-08-SH	MW-10-SH
MW-05-IN	MW-08-IN	MW-10-IN
MW-06-SH	MW-09-SH	MW-12-SH
MW-06-IN	MW-09-IN	MW-12-IN

[b] ND - Nondetect (the number in parenthesis is the detection limit).

16 VOCs, 33 SVOCs, 4 pesticides, and 23 inorganics. In addition, even though many of the inorganic chemicals may be naturally occurring in groundwater, 19 of the 23 inorganic chemicals were found at least once at a concentration above the 95% confidence upper limit background concentration listed in Table 7-14, thus indicating a valid detection of unnatural contamination. The only inorganic chemicals which were not detected above the 95% confidence upper limit background concentration listed in Table 7-14 were cadmium, chromium, antimony, and vanadium.

VOC Contamination

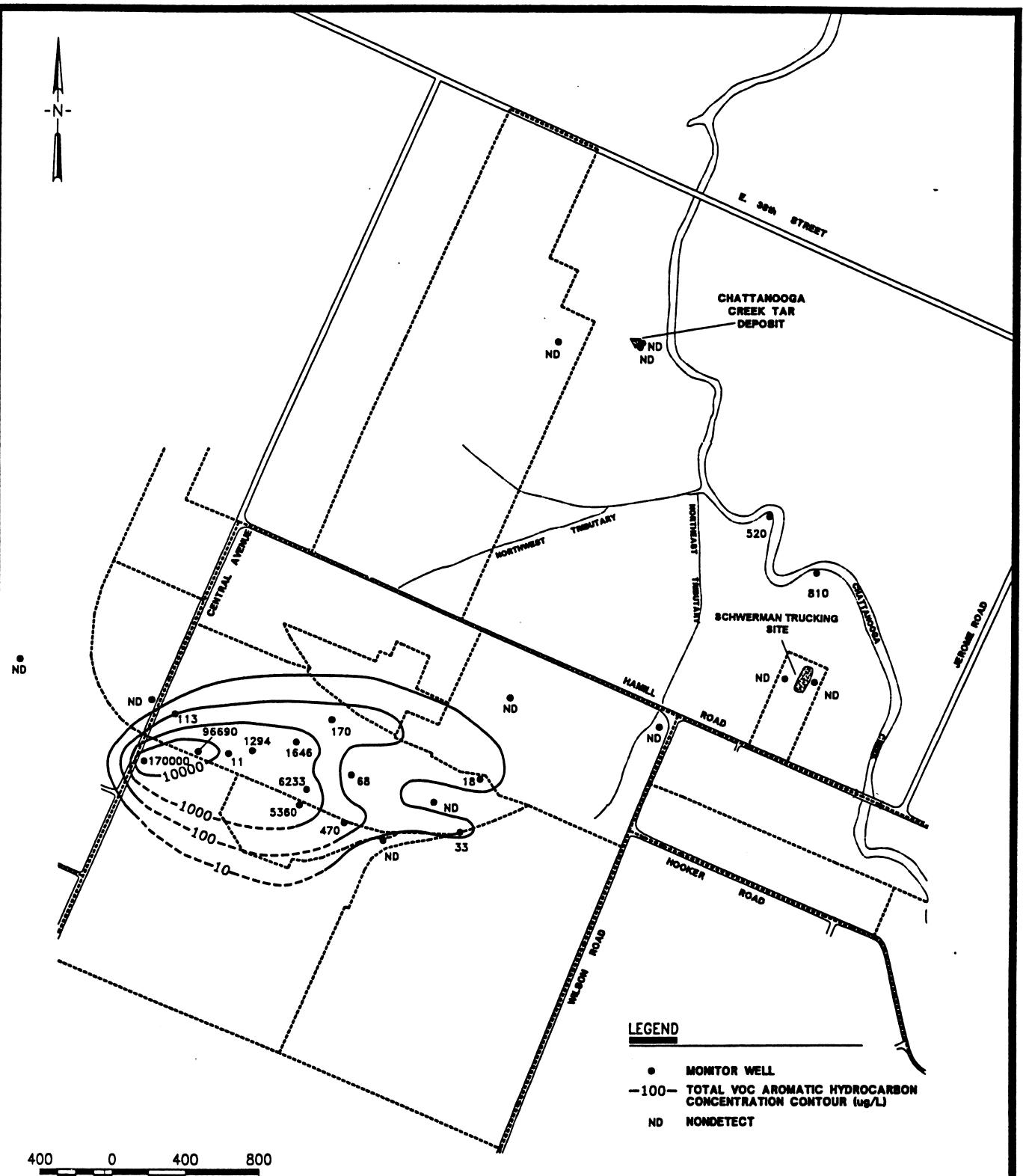
The VOCs appear to be widespread in groundwater at the coke plant. The VOC contamination can generally be grouped into three categories: aromatic hydrocarbons, chlorinated non-aromatic hydrocarbons, and acetone. The only VOC detected in groundwater at the coke plant which does not fit into one of these three categories was carbon disulfide, but this chemical had only one valid detection (at MD-05-102) which was a very low concentration (3J ug/l). The chemicals detected in groundwater at the coke plant which comprise the three VOC categories are listed in **Table 7-15**.

The three VOC groupings identified above are based primarily on the patterns of occurrence at the coke plant. Note that aromatic hydrocarbons are derived chiefly from petroleum and coal tar and thus are expected to be associated with this site. The source of the chlorinated non-aromatic hydrocarbons and acetone contamination, however, is unknown. **Figures 7-2** through **7-4** show the extent of contamination of these three groups of VOC contaminants at the site. Note that these figures (as well as the subsequent extent of groundwater contamination figure) were created by using the analytical results from the well in the well cluster which had the highest concentration. Since the wells are all screened within the same aquifer and since groundwater flow is believed to follow tortuous preferential pathways which may lead both upward and downward throughout the aquifer at this site (see Section 2.4), this method of

TABLE 7-15

CATEGORIES OF VOC CONTAMINATION IN GROUNDWATER
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

VOC Category	Chemicals
Aromatic Hydrocarbons	Benzene Toluene Chlorobenzene Ethyl Benzene Xylenes
VOC Chlorinated Nonaromatic Hydrocarbons	1,1-Dichloroethane Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethane Carbon Tetrachloride Trichloroethene Tetrachlorethene 1,2-Dichloroethene
Acetone	Acetone



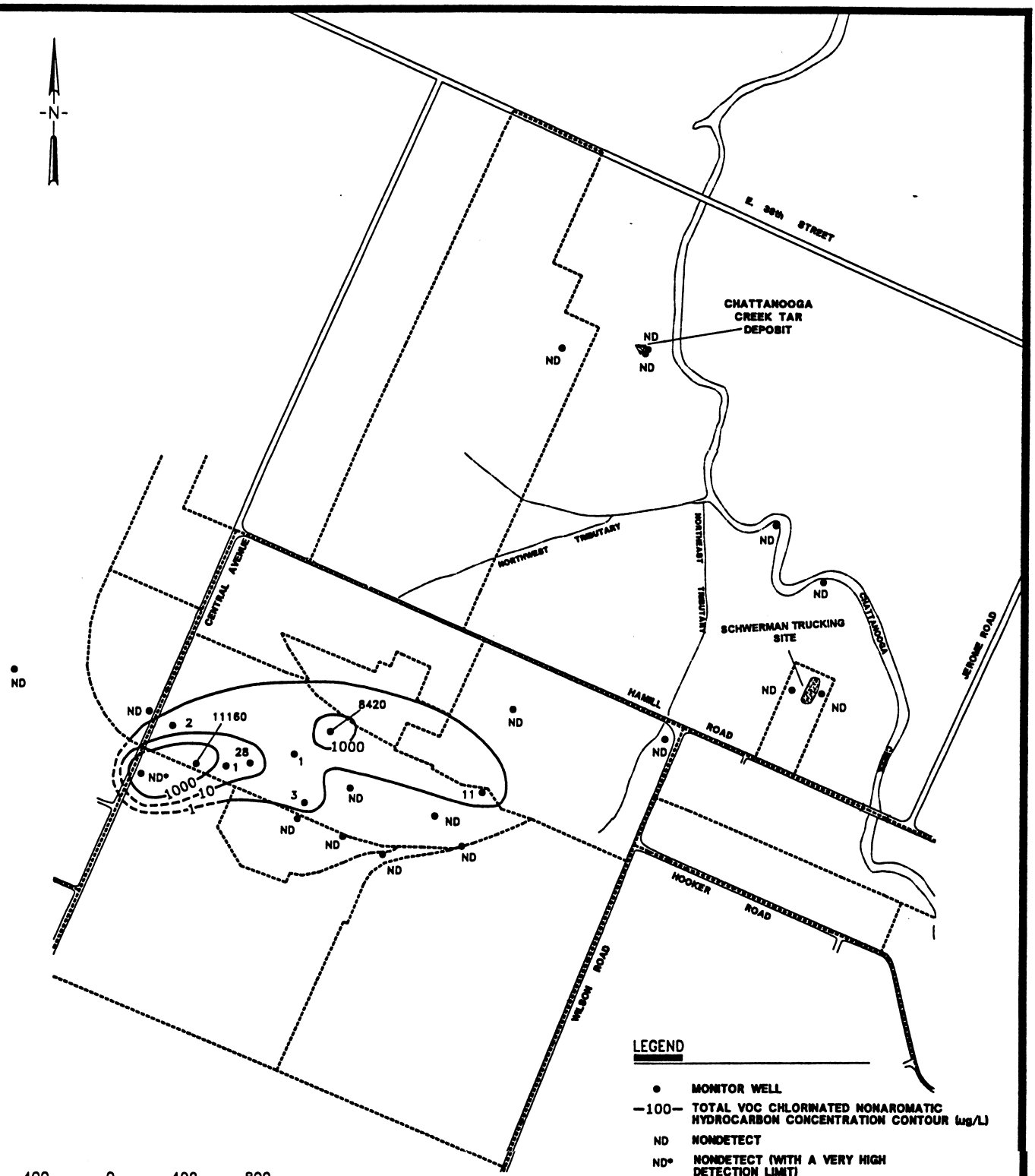
ESTIMATED EXTENT OF VOC AROMATIC HYDROCARBON CONTAMINATION IN GROUNDWATER

Tennessee Products Site
Chattanooga, Tennessee

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

FIGURE No. 7-2

VOC_AH/26JUL96/800



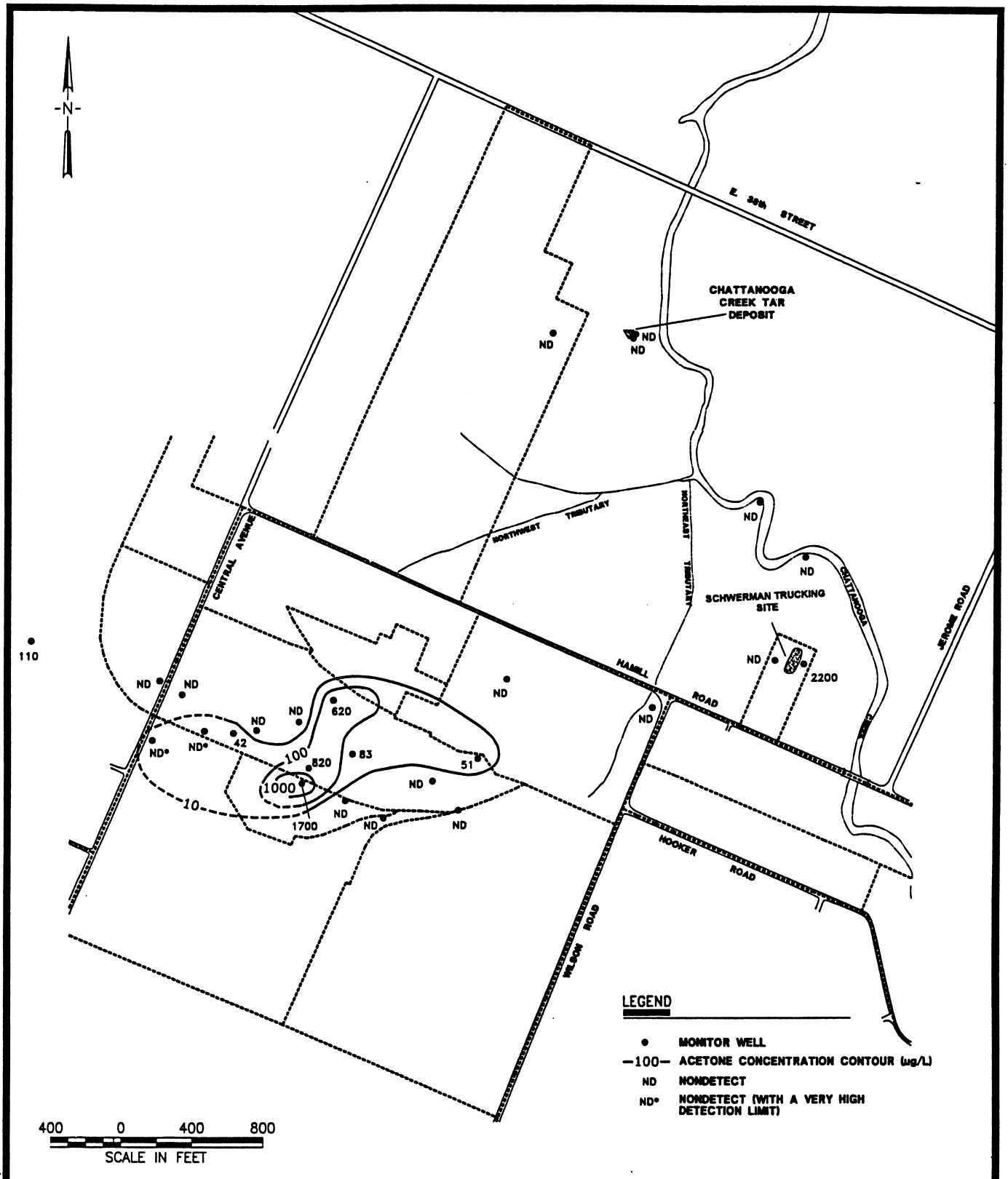
ESTIMATED EXTENT OF VOC CHLORINATED NONAROMATIC HYDROCARBON CONTAMINATION IN GROUNDWATER

Tennessee Products Site
Chattanooga, Tennessee

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

FIGURE No. 7-3

VOC_CN/26JUL96/800



ESTIMATED EXTENT OF ACETONE CONTAMINATION IN GROUNDWATER

Tennessee Products Site
Chattanooga, Tennessee

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

FIGURE No. 7-4

ACE_CONT/26JUL96/800

depicting extent of contamination is believed to be most appropriate for this site. This does not indicate, however, that contamination was found throughout the entire depth of the aquifer at the concentrations depicted. To the contrary, contamination at a well cluster was very often found to be isolated to only one of the zones of the aquifer monitored at the cluster, which is not necessarily the same zone where the same contaminants were found at another well cluster. This varying zonation of contaminants further supports the concept of preferential groundwater migration pathways for this site.

SVOC Contamination

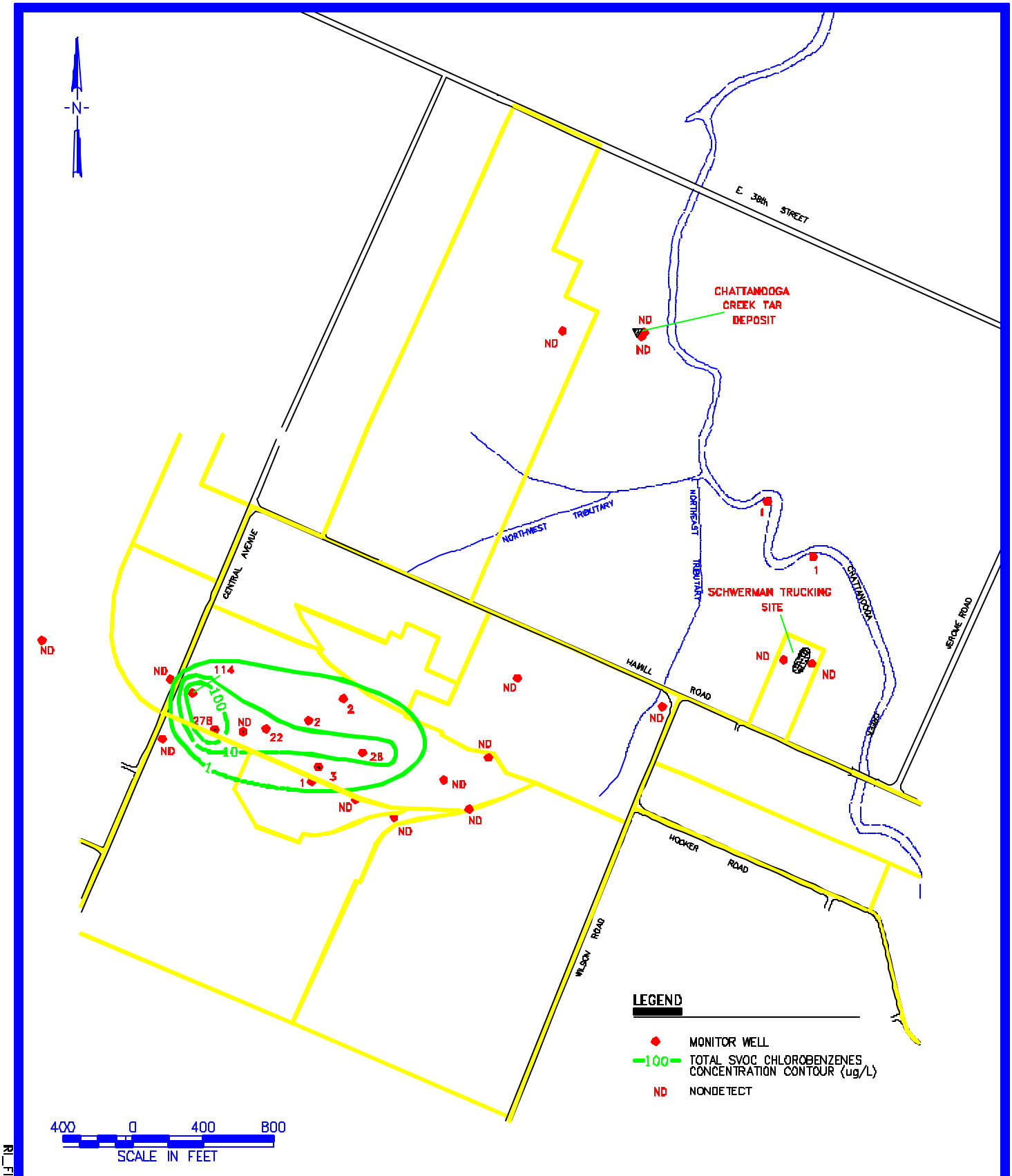
The SVOCs also appear to be widespread in groundwater at the coke plant. The SVOC contamination found at the coke plant can generally be grouped into three categories: SVOC chlorobenzenes, PAHs and dibenzofuran, and phenols. The only SVOCs detected in groundwater at the coke plant which do not fit into one of these three categories were N-nitrosodiphenylamine, di-N-butylphthalate, and bis(2-ethylhexyl)phthalate. N-nitrosodiphenylamine and di-N-butylphthalate were detected only once (at MD-06-73 and MW-04-DP, respectively) and at very low concentrations (11J and 8J ug/l, respectively). Bis(2-ethylhexyl)phthalate was also only detected once (at VC-13), but at a concentration of 500J ug/l. The chemicals detected in groundwater at the coke plant which comprise the three SVOC categories are listed in **Table 7-16**.

Like the three VOC groupings, the three SVOC groupings identified above are based primarily on the patterns of occurrence at the coke plant. Note that the chemicals listed in Table 7-16 are petroleum and coal tar derivatives and thus are expected to be associated with this site. **Figures 7-5** through **7-7** show the extent of contamination of these three groups of SVOC contaminants at the site. Note that Figure 7-6 only presents total PAH concentrations which does not include dibenzofuran. The distribution of dibenzofuran is very similar to the distribution of PAHs which is why it is grouped with the PAHs. Since dibenzofuran is

TABLE 7-16

CATEGORIES OF SVOC CONTAMINATION IN GROUNDWATER
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

SVOC Category	Chemicals
Chlorobenzenes	1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2,4-Trichlorbenzene
Polyaromatic Hydrocarbons (PAHs) and Dibenzofuran	Naphthalene 2-Chloronaphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo-a-pyrene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene 2-Methylnaphthalene Carbazole Dibenzofuran
Phenols	2-Chlorophenol Phenol 2,4-Dimethylphenol 2,4-Dichlorophenol 4-Chloro-3-Methylphenol 2-Methylphenol (3- and/or 4-)methylphenol 2,4,5-Trichlorophenol



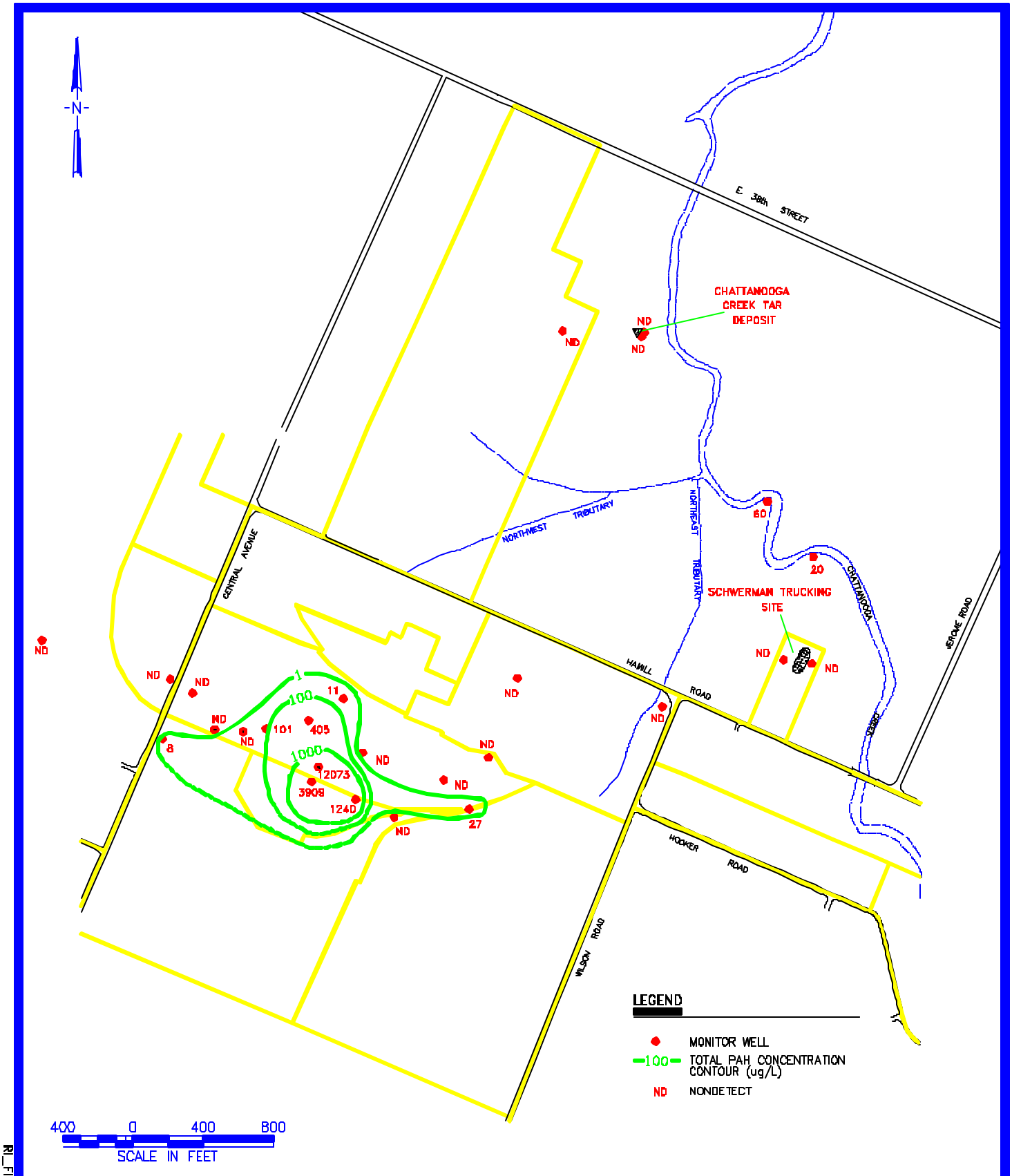
ESTIMATED EXTENT OF SVOC CLOROBENZENE CONTAMINATION IN GROUNDWATER

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc

Tennessee Products Site
Chattanooga, Tennessee

FIGURE No. 7-5

RI_FIG_7-5.dwg
Mar 99



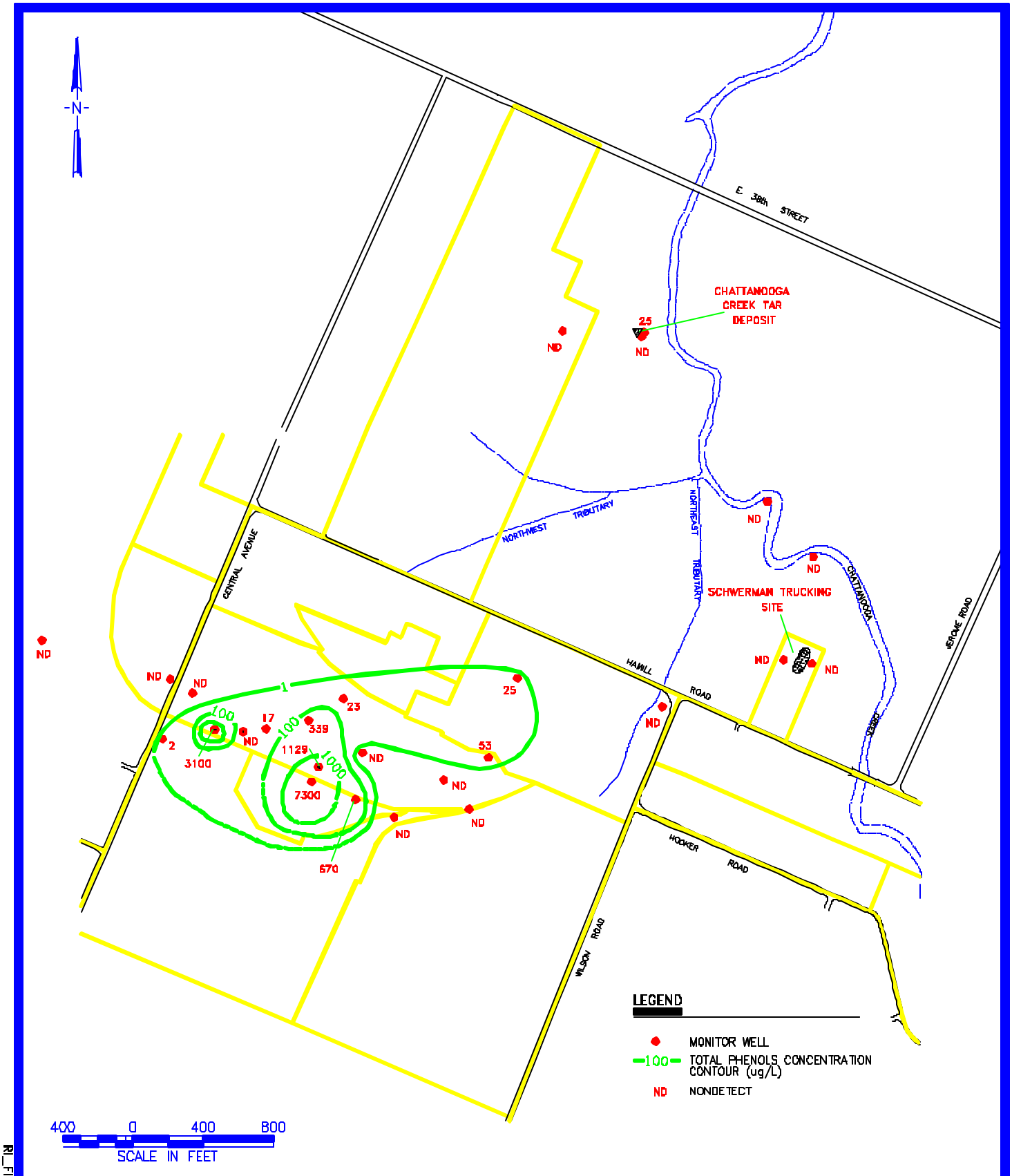
ESTIMATED EXTENT OF PAH CONCENTRATION IN GROUNDWATER

Tennessee Products Site
Chattanooga, Tennessee

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc

FIGURE No. 7-6

RI_FIG_7-6.dwg Mar 99



ESTIMATED EXTENT OF PHENOLS CONTAMINATION IN GROUNDWATER

CDM FEDERAL PROGRAMS CORPORATION
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Tennessee Products Site
Chattanooga, Tennessee

FIGURE No. 7-7

RI_FIG_7-3.dwg Mar 99

not a PAH, however, it is not appropriate to sum dibenzofuran concentrations with the PAH concentrations.

Pesticide Contamination

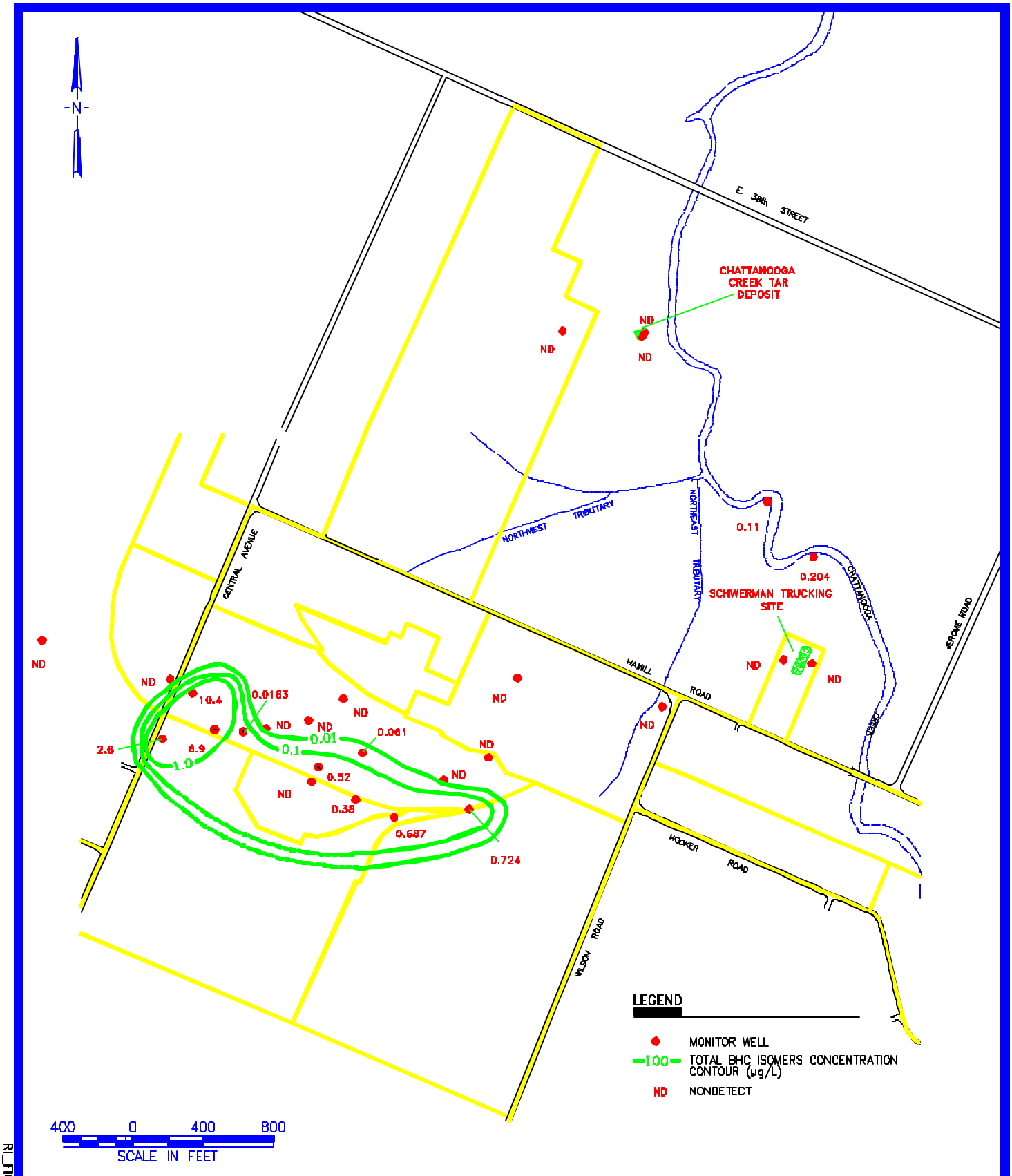
As only four pesticides were detected in groundwater at the coke plant and all four pesticides are BHC isomers, the pesticide contamination can be grouped into one category (BHC isomers). **Figure 7-8** shows the extent of BHC isomer contamination at the site. Note that unlike the VOC and SVOC contamination in groundwater at the coke plant, the pesticide contamination appears to be limited primarily to the southern half of the coke plant area. While BHC isomers are not generally associated with petroleum and coal tar, the Tennessee Products Corporation is reported to have expanded operations in the 1950s to include a facility which synthesized gamma BHC. Thus, it is expected that BHC isomers are associated with this site.

Inorganic Chemical Contamination

Like the VOCs and SVOCs, the inorganic chemical contamination in groundwater also appears to be widespread at the coke plant. However, unlike the VOCs and SVOCs, the individual contaminant concentrations appear to be erratic (i.e., no patterns are discernable). Hence, the inorganic chemicals could not be grouped into any specific categories, and no attempt was made to contour the chemical concentrations. Instead, as shown in **Figure 7-9**, the areal extent of contamination was estimated by examining which wells had concentrations of inorganic chemicals which are considered to reflect valid detections of unnatural contamination.

Overall Extent of Groundwater Contamination

The extent of groundwater contamination at the coke plant appears to be limited primarily to the coke plant and Velsicol Chemical Company properties. Although it is likely some



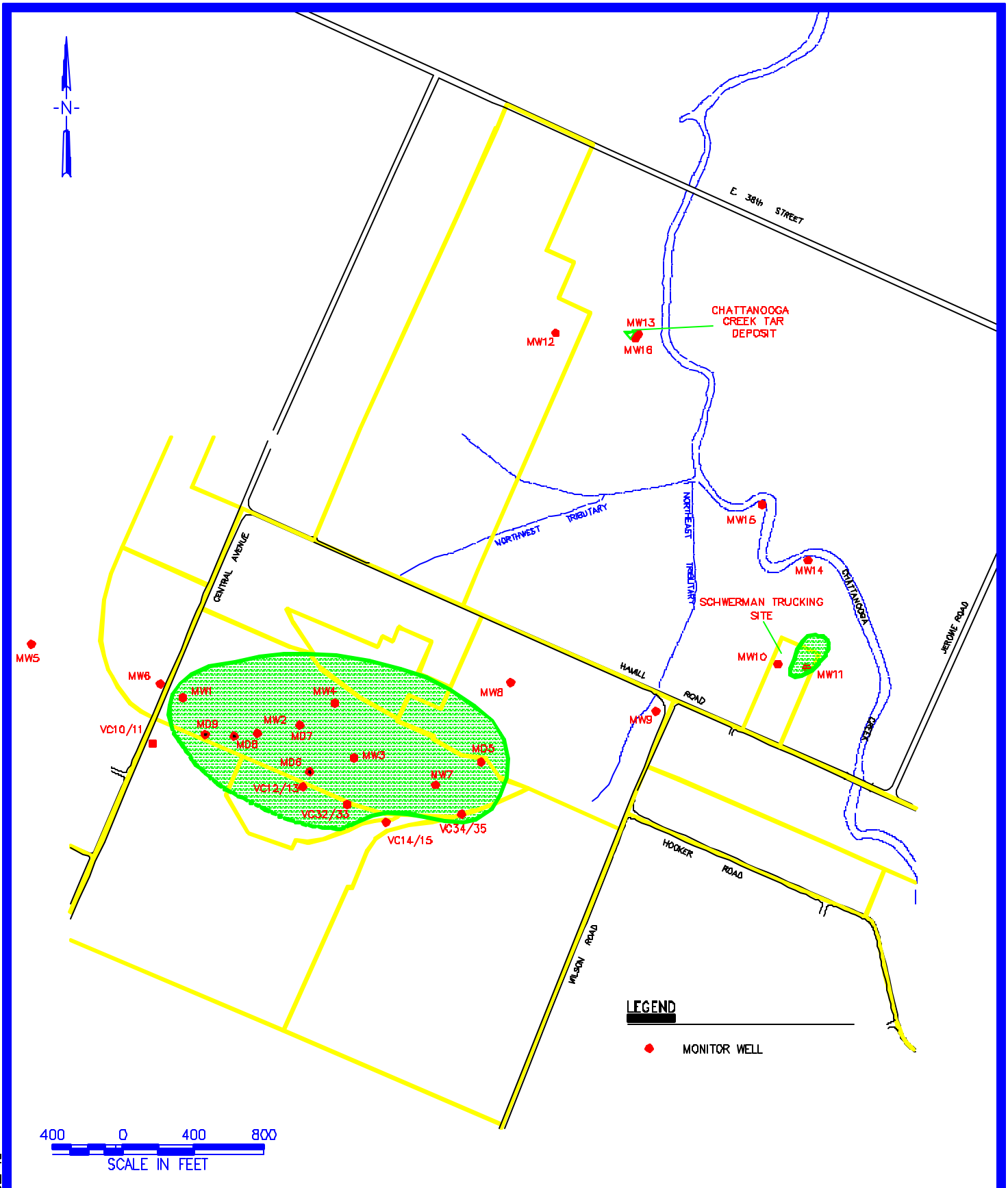
ESTIMATED EXTENT OF BHC ISOMER CONTAMINATION IN GROUNDWATER

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc

Tennessee Products Site
Chattanooga, Tennessee

FIGURE No. 7-8

RI_FIG_7-8.dwg Mar 96



ESTIMATED EXTENT OF INORGANIC CHEMICAL CONTAMINATION

Tennessee Products Site
Chattanooga, Tennessee

CDM FEDERAL PROGRAMS CORPORATION
a subsidiary of Camp Dresser & McKee Inc.

FIGURE No. 7-9

RI_FIG_7-9.dwg Mar 99

groundwater contamination has migrated downgradient onto the Morningside Chemical Company and Landes Company Sites, it appears that the extent of this migration has been minimal as only one organic chemical (2,4,5-trichlorophenol) was detected in monitor well cluster MW-08 at a very low concentration (25J ug/l), and no organic chemicals were detected in monitor well cluster MW-09.

Based on the VOC, SVOC, and pesticide groundwater plumes shown in Figures 7-2 through 7-8, it is apparent that there are at least two strong source areas of contamination in groundwater at the coke plant. The first source area is in the southwest corner of the site near monitor wells MD-09, VC-10/11, and MW-01. The second source area is in the southcentral portion of the site along the coke plant boundary near monitor wells MD-06 and VC-12/13. Although not quite as apparent, the distribution of inorganic chemical contamination also supports designation of these two areas as strong source areas, as the greatest number of inorganics and the highest concentrations of inorganics were generally found in monitor wells located in these areas.

NAPLs

The two strong source areas identified through groundwater sampling are expected since DNAPL pools were visually discovered during drilling of both monitor wells MD-09-20 and VC-13 prior to this RI (see Law Environmental 1994 and ERM 1995). These two monitor wells are located at the apparent center of the source areas. The analysis of a DNAPL sample collected from MD-09-20 by Mead Corporation (see **Tables 7-17** and **7-18** for the analytical results) indicates high concentrations of several VOCs and SVOCs common to the groundwater contamination identified at the coke plant.

No other NAPL pools were visually discovered in any of the monitor wells constructed or sampled during this RI. However, the potential for NAPLs (both DNAPLs and LNAPLs) in groundwater at other areas of the site is very much present based on the history of site

TABLE 7-17

1995 DNAPL SAMPLING ANALYTICAL RESULTS - VOCS
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant	
Well ID:	MD-09-20	
CHEMICAL		
Chloromethane	1400000	U
Bromomethane	1400000	U
Vinyl chloride	1400000	U
Chloroethane	1400000	U
Methylene chloride	1400000	U
Acetone	1400000	UJ
Carbon disulfide	1400000	U
1,1-Dichloroethene	1400000	U
1,1-Dichloroethane	1400000	U
1,2-Dichloroethene (Total)	1400000	U
Chloroform	1400000	U
1,2-Dichloroethane	1400000	U
2-Butanone	1400000	U
1,1,1-Trichloroethane	1400000	U
Carbon tetrachloride	1400000	U
Bromodichloromethane	270000	J
1,2-Dichloropropane	1400000	U
Cis-1,3-Dichloropropene	1400000	U
Trichloroethene	1400000	U
Dibromochloromethane	1400000	U
1,1,2-Trichloroethane	1400000	U
Benzene	1400000	U
Trans-1,3-Dichloropropene	1400000	U
Bromoform	1400000	U
4-Methyl-2-pentanone	1400000	U
2-Hexanone	1400000	U
Tetrachloroethene	7800000	
1,1,2,2-Tetrachloroethane	1400000	U
Toluene	28000000	
Chlorobenzene	220000	J
Ethyl benzene	1400000	U
Styrene	1400000	U
Xylenes (Total)	1400000	U

Data Qualifiers:
U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.
J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate. The value preceding the "J" is the estimated value.
UJ = The chemical was analyzed for, but not detected. The value is estimated for the minimum quantitation limit.

Concentrations presented in ug/L.

TABLE 7-18

1995 DNAPL SAMPLING ANALYTICAL RESULTS - SVOCS
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant	
Well ID:	MD-09-20	
CHEMICAL		
Phenol	60000	U
bis(2-Chloroethyl)ether	60000	U
2-Chlorophenol	60000	U
1,3-Dichlorobenzene	60000	U
1,4-Dichlorobenzene	1200000	J
1,2-Dichlorobenzene	650000	J
2-Methylphenol	60000	U
2,2'-Oxybis(1-chloropropane)	60000	U
4-Methylphenol	60000	U
N-Nitroso-di-n-propylamine	60000	U
Hexachloroethane	60000	U
NB	60000	U
Isophorone	60000	U
2-Nitrophenol	60000	U
2,4-Dimethylphenol	60000	U
bis(2-Chloroethoxy)methane	60000	U
2,4-Dichlorophenol	60000	U
1,2,4-Trichlorobenzene	80000	
Naphthalene	10000	J
4-Chloroaniline	60000	U
Hexachlorobutadiene	60000	U
4-Chloro-3-methylphenol	60000	U
2-Methylnaphthalene	60000	U
Hexachlorocyclopentadiene	60000	U
2,4,6-Trichlorophenol	60000	U
2,4,5-Trichlorophenol	150000	U
2-Chloronaphthalene	60000	U
2-Nitroaniline	150000	U
Dimethyl phthalate	60000	U
Acenaphthylene	60000	U
2,6-Dinitrotoluene	60000	U
3-Nitroaniline	150000	U
Acenaphthene	60000	U

Data Qualifiers:
U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.
J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate.
The value preceding the "J" is the estimated value.

Concentrations presented in ug/L.

TABLE 7-18 (cont.)

1995 DNAPL SAMPLING ANALYTICAL RESULTS - SVOCS
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location:	Coke Plant	
Well ID:	MD-09-20	
CHEMICAL		
2,4-Dinitrophenol	150000	U
4-Nitrophenol	150000	U
Dibenzofuran	60000	U
2,4-Dinitrotoluene	60000	U
Diethylphthalate	60000	U
4-Chlorophenyl-phenylether	60000	U
Fluorene	60000	U
4-Nitroaniline	150000	U
4,6-Dinitrol-2-methylphenol	150000	U
N-nitrosodiphenylamine	60000	U
4-Bromophenyl-phenylamine	60000	U
Hexachlorobenzene	35000	J
Pentachlorophenol	150000	U
Phenanthrene	25000	J
Anthracene	13000	J
Carbazole	60000	U
Di-n-butyl phthalate	60000	U
Fluoranthene	13000	J
Pyrene	60000	U
Butyl benzyl phthalate	60000	U
3,3'-Dichlorobenzidine	60000	U
Benzo(a)anthracene	60000	U
Chrysene	20000	J
bis(2-Ethylhexyl)phthalate	35000000	
Di-n-octyl phthalate	60000	U
Benzo(b)fluoranthene	8500	J
Benzo(k)fluoranthene	8900	J
Benzo(a)pyrene	60000	U
Indeno(1,2,3-cd)pyrene	60000	U
Dibenzo(a,h)anthracene	60000	U
Benzo(g,h,i)perylene	60000	U

Data Qualifiers:
U = The chemical was analyzed for but not detected. The value preceding the "U" is the minimum quantitation limit.
J = The qualitative analysis of the chemical is acceptable, but the value can not be considered as accurate.
The value preceding the "J" is the estimated value.

Concentrations presented in ug/L.

activities, as well as the groundwater analytical data collected to date. To evaluate the potential for NAPLs, the effective solubilities of all the VOCs were calculated as described in *Estimating Potential for Occurrence of DNAPL at Superfund Sites* (EPA, 1992) for all the groundwater samples collected. The actual measured VOC concentrations were then divided by their effective solubilities to determine their percent of effective solubility. Seven monitor wells (including MD-09-20 and VC-13) had VOC concentrations which exceeded 1% of their effective solubility, thus indicating potential for NAPL. The percent effective solubility calculation results are summarized in **Table 7-19** for these seven monitor wells. As indicated in this table, 3 monitor well samples indicate potential for LNAPLs (BTEX chemicals), 2 monitor well samples indicate potential for DNAPLs (chlorinated VOC chemicals), and 2 monitor well samples indicate potential for both LNAPLs and DNAPLs. Note that these seven monitor wells are all located in different monitor well clusters and at varying elevations (hydrostratigraphic zones). However, they are all generally located within the historic processing area of the coke plant (i.e., the western side of the coke plant property). Thus, while there is much uncertainty with respect to the exact locations of all NAPL pools at the site, the general area where NAPL pools may exist appears to be fairly well defined.

7.3.3 Schwerman Trucking Site

As indicated in Tables 7-8 and 7-9, far fewer chemicals were detected in the groundwater samples collected from the monitor wells at Schwerman Trucking Site than in groundwater collected at the coke plant. The spectrum of chemicals detected in at least one groundwater sample from this area included only 3 VOCs and 18 inorganics, and only 10 of the 18 inorganic chemicals were found at a concentration above the 95% confidence upper limit background concentration listed in Table 7-14.

The nature of the organic contamination in groundwater at ST Site appears to be much different than at the coke plant. No SVOCs or pesticides were detected in any of the groundwater samples collected from this area, and of the 3 VOCs detected, only acetone was

TABLE 7-19

PERCENT EFFECTIVE SOLUBILITY CALCULATIONS FOR VOCS
TENNESSEE PRODUCTS SITE
CHATTANOOGA, TENNESSEE

Well Location: / Well ID: / CHEMICAL	Upgradient VC-10	Upgradient VC-13	Coke Plant MW-02-DP	Coke Plant MW-04-DP	Coke Plant MD-06-73	Coke Plant MD-07-12	Coke Plant MD-09-20 (DUP.)
VOLATILE ORGANICS							
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	1.4%
1,2-DICHLOROETHANE	ND	ND	ND	0.0%	ND	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	1.3%	2.2%	ND	ND
CARBON TETRACHLORIDE	ND	ND	ND	ND	ND	ND	21.5%
TRICHLOROETHENE	ND	ND	ND	0.5%	ND	ND	ND
BENZENE	ND	0.4%	0.1%	ND	0.2%	0.1%	ND
TETRACHLOROETHENE	ND	ND	1.4%	4.7%	ND	ND	123.5%
TOLUENE	33.0%	1.6%	ND	ND	0.7%	0.3%	20.0%
CHLOROBENZENE	ND	ND	0.3%	ND	0.9%	ND	25.8%
ETHYL BENZENE	ND	6.3%	0.9%	ND	2.8%	1.3%	ND
TOTAL XYLENES	ND	4.9%	0.7%	ND	ND	1.0%	ND
ACETONE	ND	0.0%	ND	0.0%	ND	ND	ND
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHENE (TOTAL)	ND	ND	ND	ND	ND	ND	ND

Notes:

ND = Chemical was not detected.

All calculations based on VOC chemical data only. SVOC and pesticide concentrations were not considered in the effective solubility calculations as a conservative measure to indicate potential for NAPL in the monitor well. The presence of other organic chemicals in the well will decrease the effective solubilities of the VOCs, and thus increase the percent of effective solubility for the measured concentrations. Concentrations greater than 1% of the effective solubility are considered to indicate potential for NAPL in the monitor well.

found at the coke plant. The other two VOCs (ketones) where not found in any of the other monitor wells sampled during this investigation.

The nature of the inorganic contamination also appears to be slightly different than at the coke plant. While most of the inorganic chemical concentrations measured in groundwater at ST Site are similar to those measured in groundwater at the coke plant, the concentration of nickel found in MW-11-SH is significantly (two orders of magnitude) higher. In addition, the concentrations of both cadmium and vanadium found in MW-11-SH exceeded the 95% confidence upper limit background concentrations listed in Table 7-14, whereas at the coke plant, these two inorganic chemicals were not measured above the upper limit background concentrations.

The majority of the groundwater contamination was found in MW-11-SH, indicating that contamination may be limited primarily to the soil overburden zone of the aquifer at this source area. Arsenic was the only chemical measured at a significant concentration in MW-11-IN. However, because well cluster MW-11 is the only well cluster downgradient of ST Site, the downgradient extent of contamination (both vertical and horizontal) from this source area is uncertain. Nevertheless, migration of contaminants in groundwater from ST Site, is likely limited to a small area due to the nearby presence of Chattanooga Creek, a groundwater discharge point.

7.3.4 CHATTANOOGA CREEK TAR DEPOSIT

As indicated in Tables 7-10 and 7-11, the number of chemicals detected in the groundwater samples collected from the monitor wells at the Chattanooga Creek Tar Deposit was much less than at both the coke plant and ST Site. The spectrum of chemicals having at least one valid detection in the groundwater samples collected from this area included only 1 SVOC and 15 inorganics, and none of the 15 inorganic chemicals were found at a concentration above the 95% confidence upper limit background concentration listed in Table 7-14. The lone SVOC detected was 2,4,5-trichlorophenol in MW-13-SH, and the concentration measured was 25J which is also the detection limit for this

chemical. Thus, the extent of groundwater contamination at the Chattanooga Creek Tar Deposit is considered to be minimal, if not insignificant.

7.3.5 CHATTANOOGA CREEK SEDIMENTS

As indicated in Tables 7-12 and 7-13, the number of chemicals detected in the groundwater samples collected from the monitor wells located adjacent to Chattanooga Creek was much less than at the coke plant, but more than at ST Site and the Chattanooga Creek Tar Deposit. The spectrum of chemicals having at least one valid detection in the groundwater samples collected from this area included 1 VOC, 6 SVOCs, 4 pesticides, and 10 inorganics, but only 1 of the 10 inorganic chemicals was found at a concentration above the 95% confidence upper limit background concentration listed in Table 7-14.

The nature of the organic contamination in groundwater at the Chattanooga Creek appears to be very similar to that at the coke plant. All but one of the organic chemicals found in the Chattanooga Creek groundwater samples were also found at the coke plant, and all the SVOCS and the one VOC found are known to be petroleum and coal tar derivatives. The only organic chemical not found at the coke plant was dieldrin which was found in MW-14-SH at a very low concentration (0.015J ug/l). Thus, it is likely the coal tar deposits in the sediments of Chattanooga Creek are the source of the groundwater contamination found along this creek.

The nature of the inorganic contamination, however, appears to be much different than at the coke plant. While several inorganic chemicals were found in groundwater at the coke plant at significant concentrations (i.e., above the upper limit background concentration), only one inorganic chemical (iron) was found at a significant concentration in the groundwater samples collected at Chattanooga Creek. The lack of significant inorganic chemical contamination in the groundwater along Chattanooga Creek, as well as at the Chattanooga Creek Tar Deposit, may be an indication that coal tar deposits are generally not a source of inorganic chemical contamination in groundwater.

The groundwater contamination identified as being associated with the sediments of Chattanooga Creek is likely limited to a narrow band along the creek, and is also likely limited to the soil overburden zone of the aquifer due to the hydrogeology of the area. Because Chattanooga Creek is a groundwater discharge point, the contaminants are hydraulically prevented from migrating very far from the creek. Release of the contaminants from the sediments to groundwater can only occur during periods of high rainfall when the water level in Chattanooga Creek rises above the groundwater elevation, thus temporarily reversing the hydraulic gradient. This temporary flow reversal creates a mixing zone within the aquifer where the contaminants are dispersed. However, because these flow reversals do not likely occur often or for long periods of time, the contaminant mixing zone created by these flow reversals is not likely to be large. The fact that no significant contamination was found in monitor wells MW-13-SH and MW-16-SH which are located only about 100 feet from Chattanooga Creek further supports this theory of a small contaminant mixing zone.